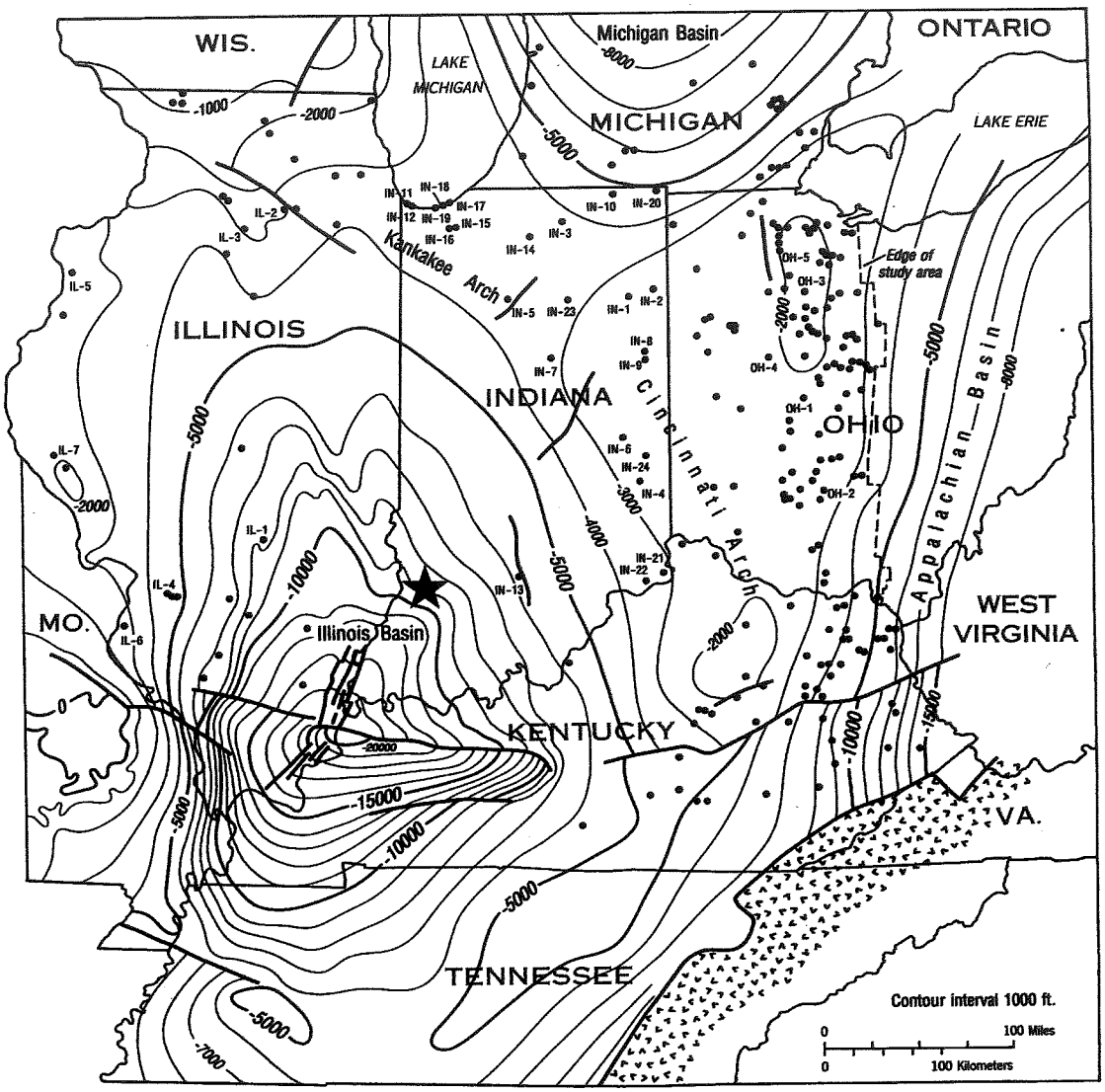


LEGEND

★ SITE LOCATION

N

SOURCE: RUDMAN AND RUPP, 1993

SUBSURFACE

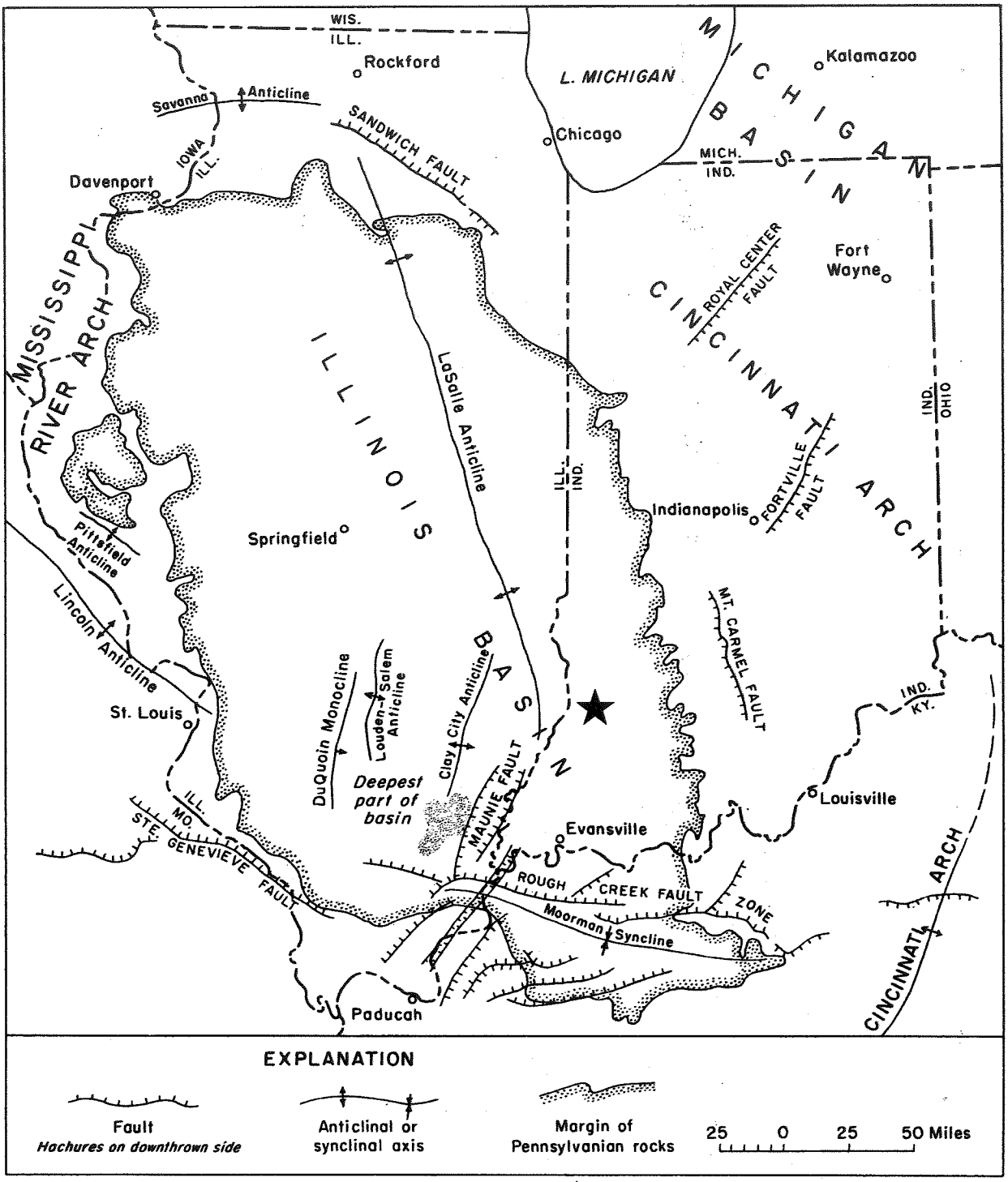
HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

FIGURE F.1-1

DUKE ENERGY
EDWARDSPORT FACILITY

GEOLOGIC SETTING OF ILLINOIS BASIN

DATE: 12/11/06	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:



LEGEND

★ SITE LOCATION

N

SOURCE: SHAVER AND AUSTIN, 1972

SUBSURFACE

HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

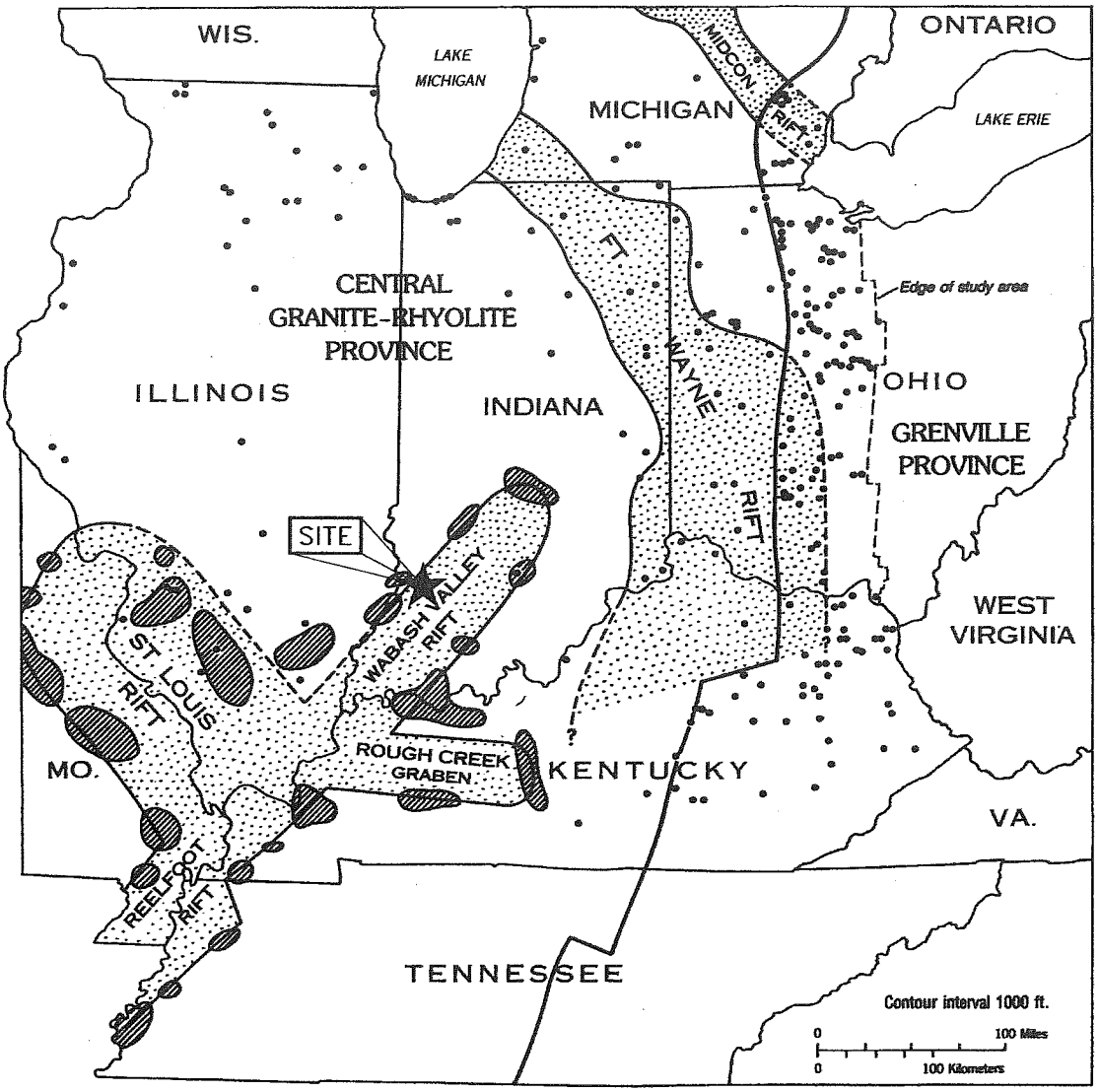
FIGURE F.1-2

DUKE ENERGY
EDWARDSPORT FACILITY

GEOLOGIC STRUCTURE OF THE EASTERN INTERIOR

DATE: 12/11/06	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:

APR 2008



LEGEND

★ SITE LOCATION

• TEST LOCATION

N

SOURCE: RUDMAN AND RUPP, 1993

SUBSURFACE

HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

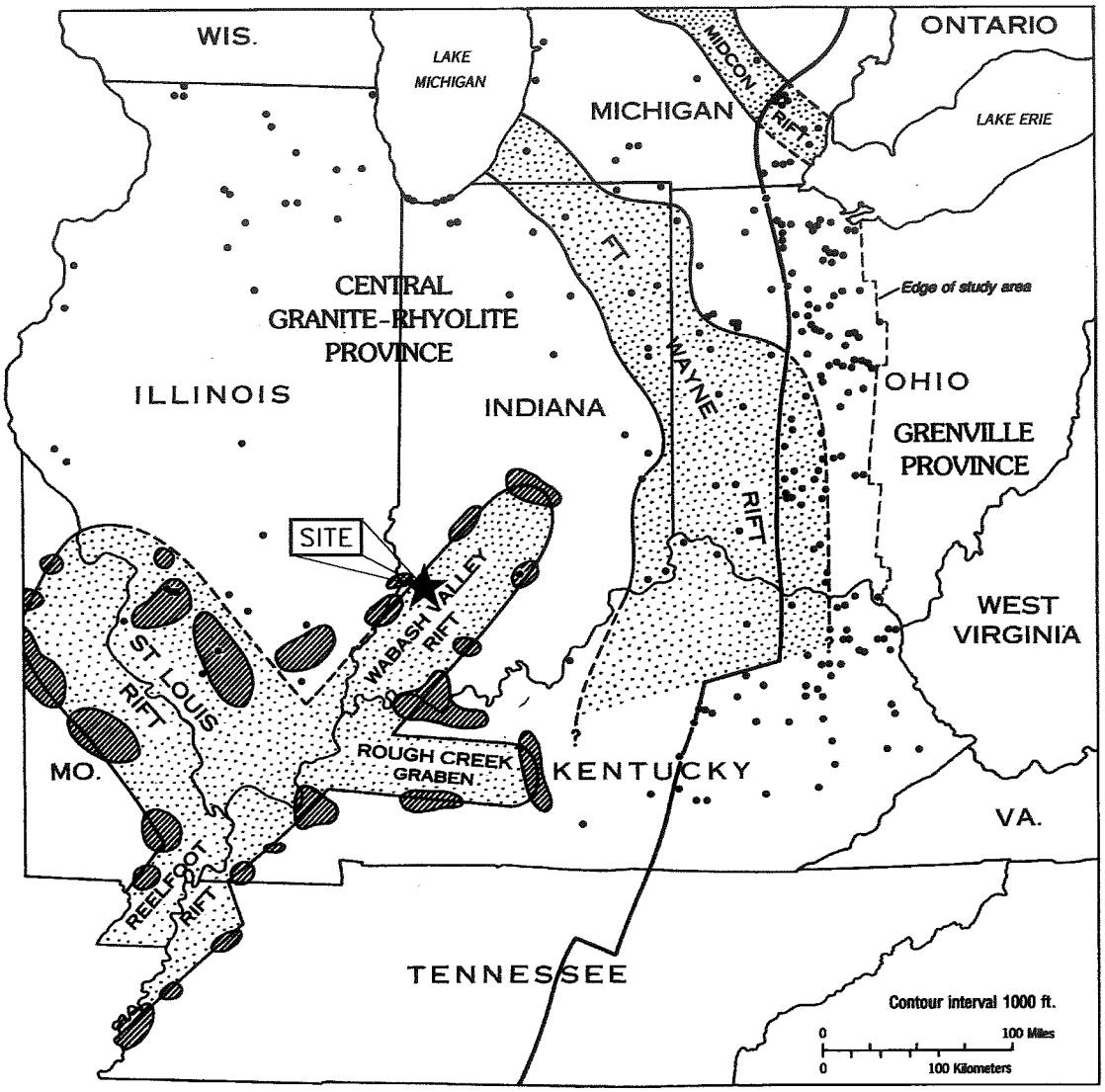
FIGURE F.1-3

DUKE ENERGY
EDWARDSPORT FACILITY

MAP OF THE MIDWEST SHOWING THE LOCATIONS OF BASEMENT TESTS AND INTERPRETED PROVINCES BASED ON LITHOGRAPHY

DATE: 3/13/08	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:

MAR — 2007



LEGEND

★ SITE LOCATION

N

SOURCE: RUDMAN AND RUPP, 1993

SUBSURFACE

HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

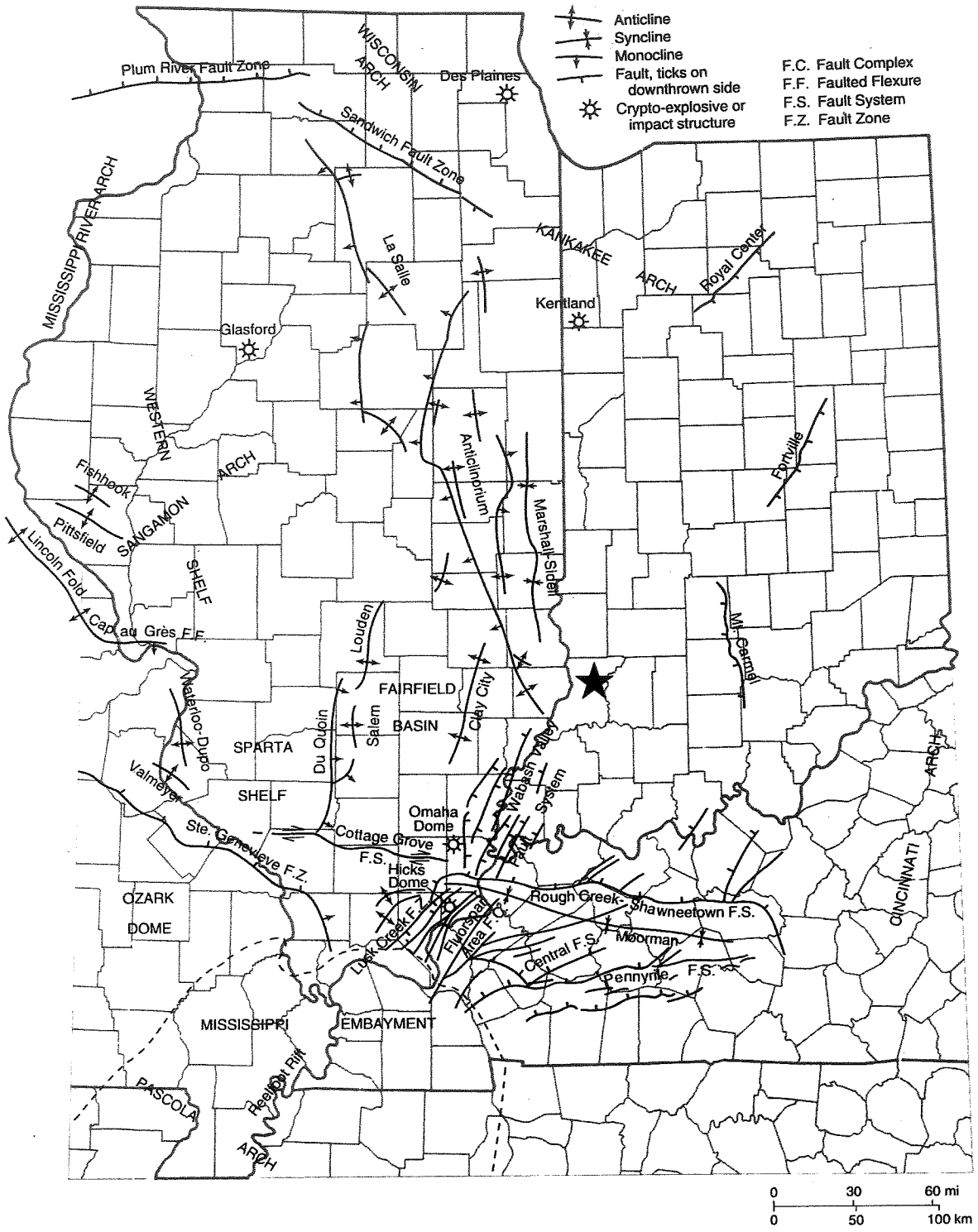
FIGURE F.1-3

DUKE ENERGY

EDWARDSPORT FACILITY

MAP OF THE MIDWEST SHOWING THE LOCATIONS OF BASEMENT TESTS AND INTERPRETED PROVINCES BASED ON LITHOGRAPHY

DATE: 12/11/06	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:



LEGEND

★ SITE LOCATION

SOURCE: NELSON, 1995

SUBSURFACE

HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

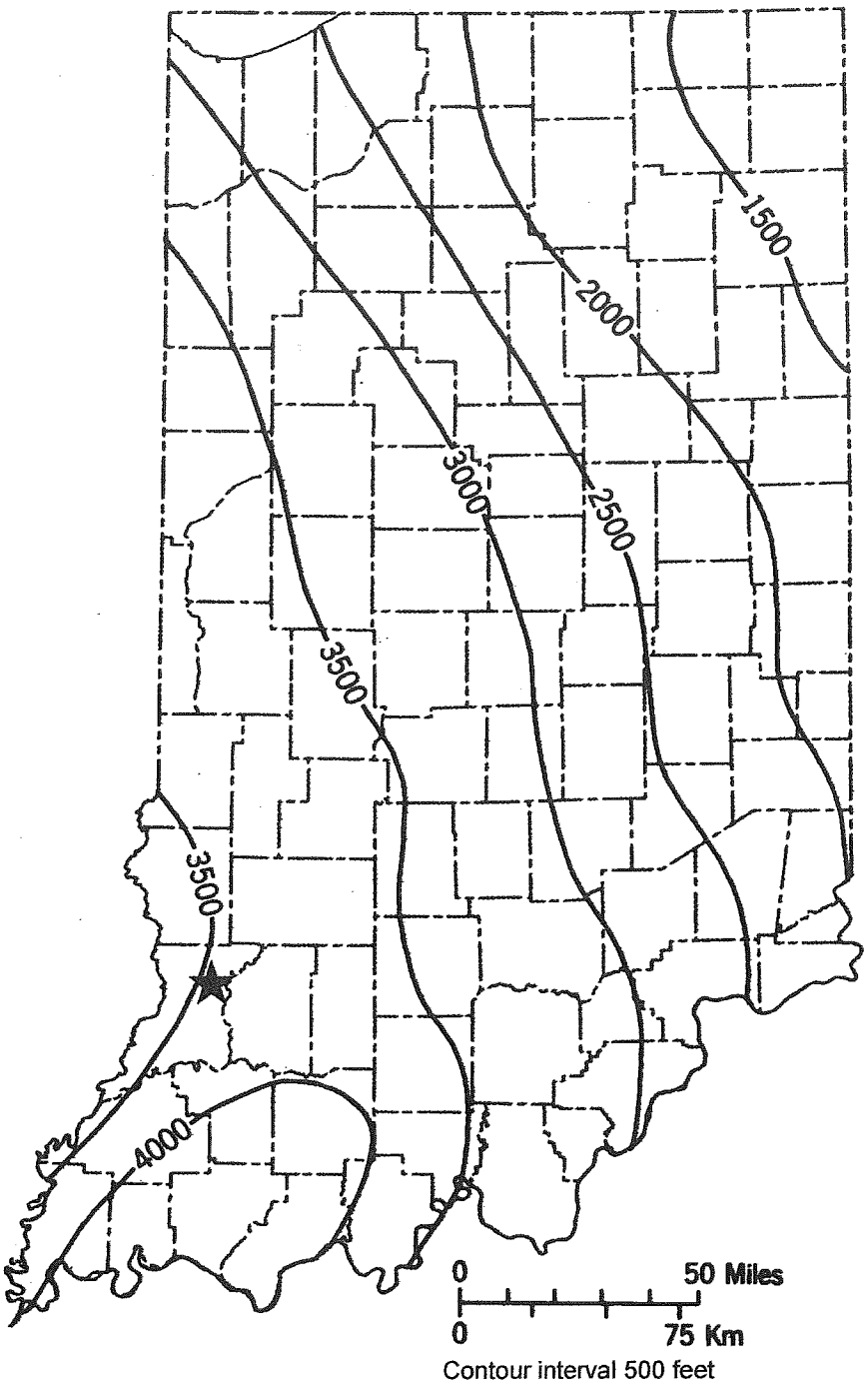
FIGURE F.1-4

DUKE ENERGY
EDWARDSPORT FACILITY

MAJOR STRUCTURAL FEATURES
IN ILLINOIS AND NEIGHBORING STATES

DATE: 12/11/06	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:

APR 2008



LEGEND

★ SITE LOCATION

N

SUBSURFACE

HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

FIGURE F.2.2-1

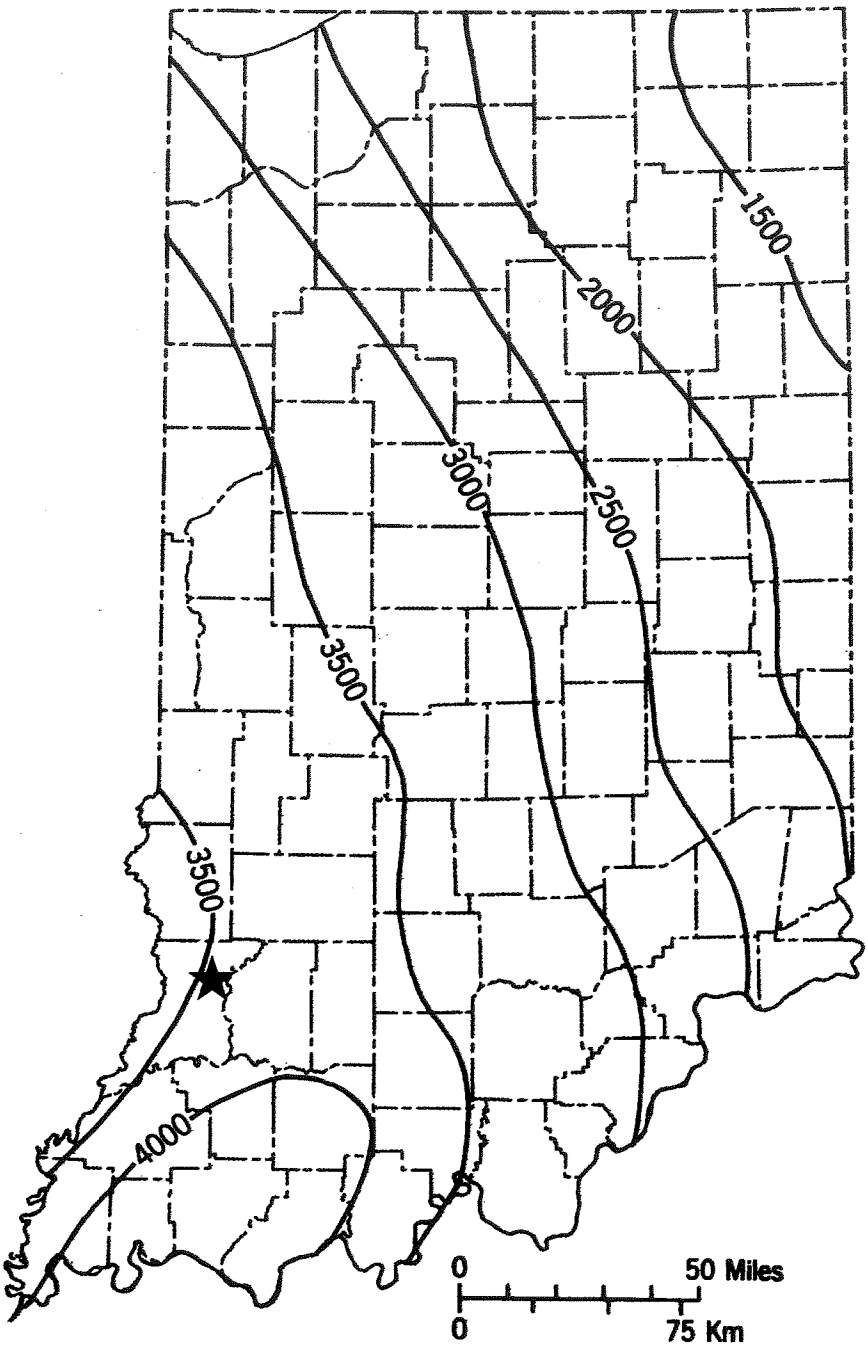
DUKE ENERGY
EDWARDSPORT FACILITY

MAP OF INDIANA SHOWING
THICKNESS OF THE CAMBRIAN SYSTEM

DATE: 3/13/08	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:

SOURCE: DROSTE AND PATTON, 1985

MAR 2007



LEGEND

★ SITE LOCATION

N

SOURCE: DROSTE AND PATTON, 1985

SUBSURFACE

HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

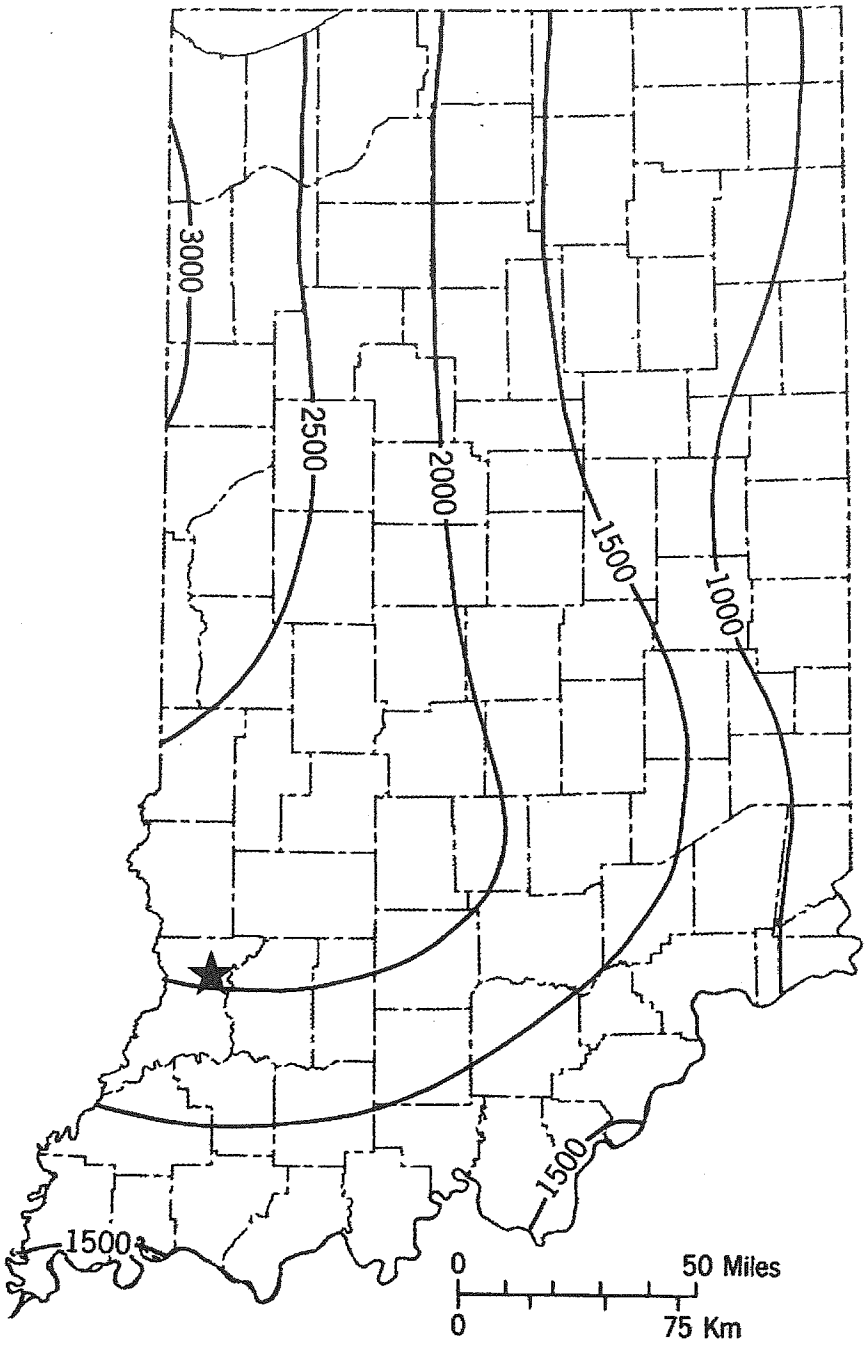
FIGURE F.2.2–1

DUKE ENERGY
EDWARDSPORT FACILITY

MAP OF INDIANA SHOWING
THICKNESS OF THE CAMBRIAN SYSTEM

DATE: 12/11/06	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:

APR ... 2008



LEGEND

★ SITE LOCATION

N

SUBSURFACE

HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

FIGURE F.2.2–2

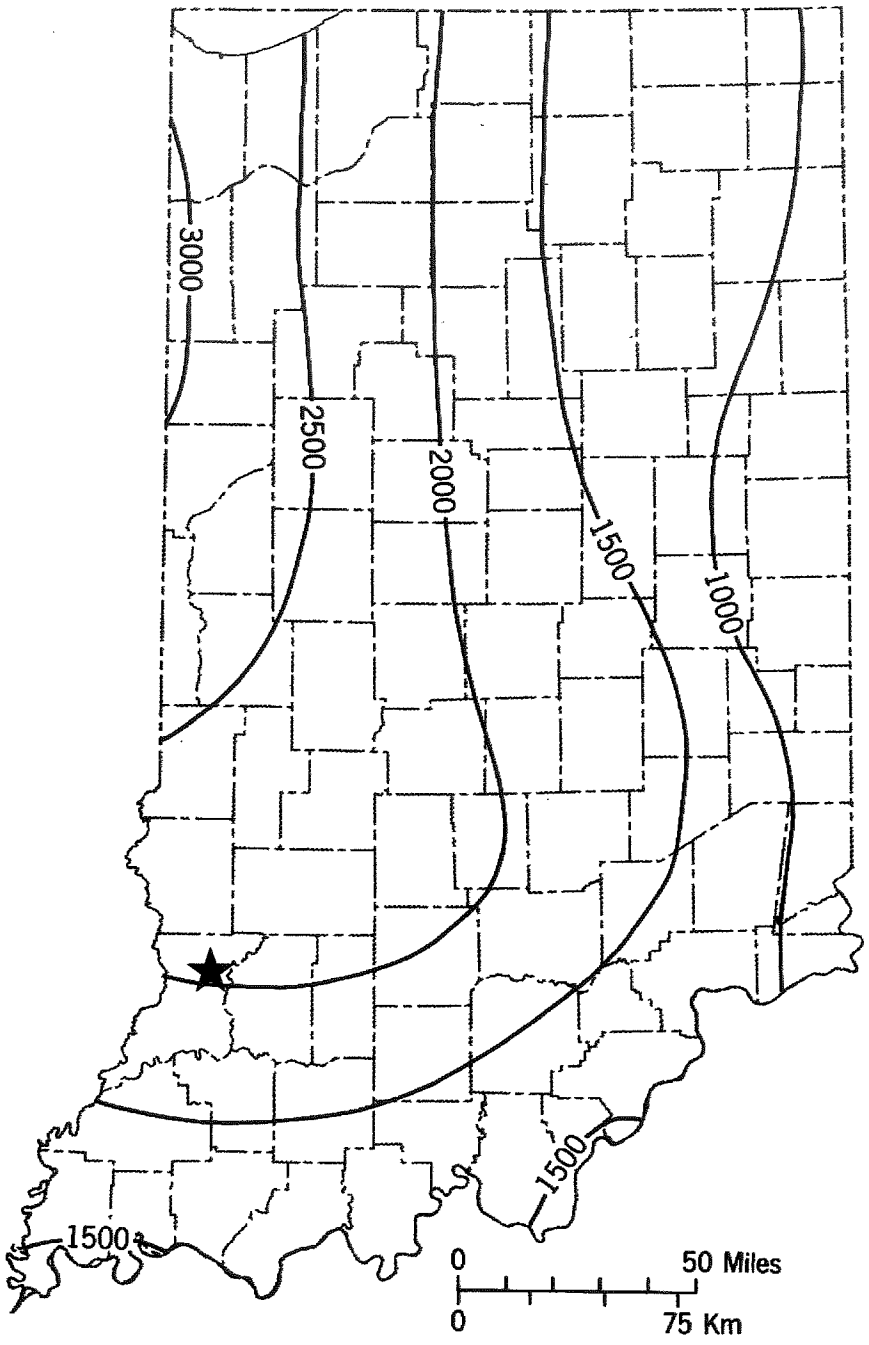
DUKE ENERGY

EDWARDSPORT FACILITY

MAP OF INDIANA SHOWING
THICKNESS OF THE POTSDAM SUPERGROUP

DATE: 3/13/08	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:

SOURCE: DROSTE AND PATTON, 1985



LEGEND

★ SITE LOCATION

N

SOURCE: DROSTE AND PATTON, 1985

SUBSURFACE

HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

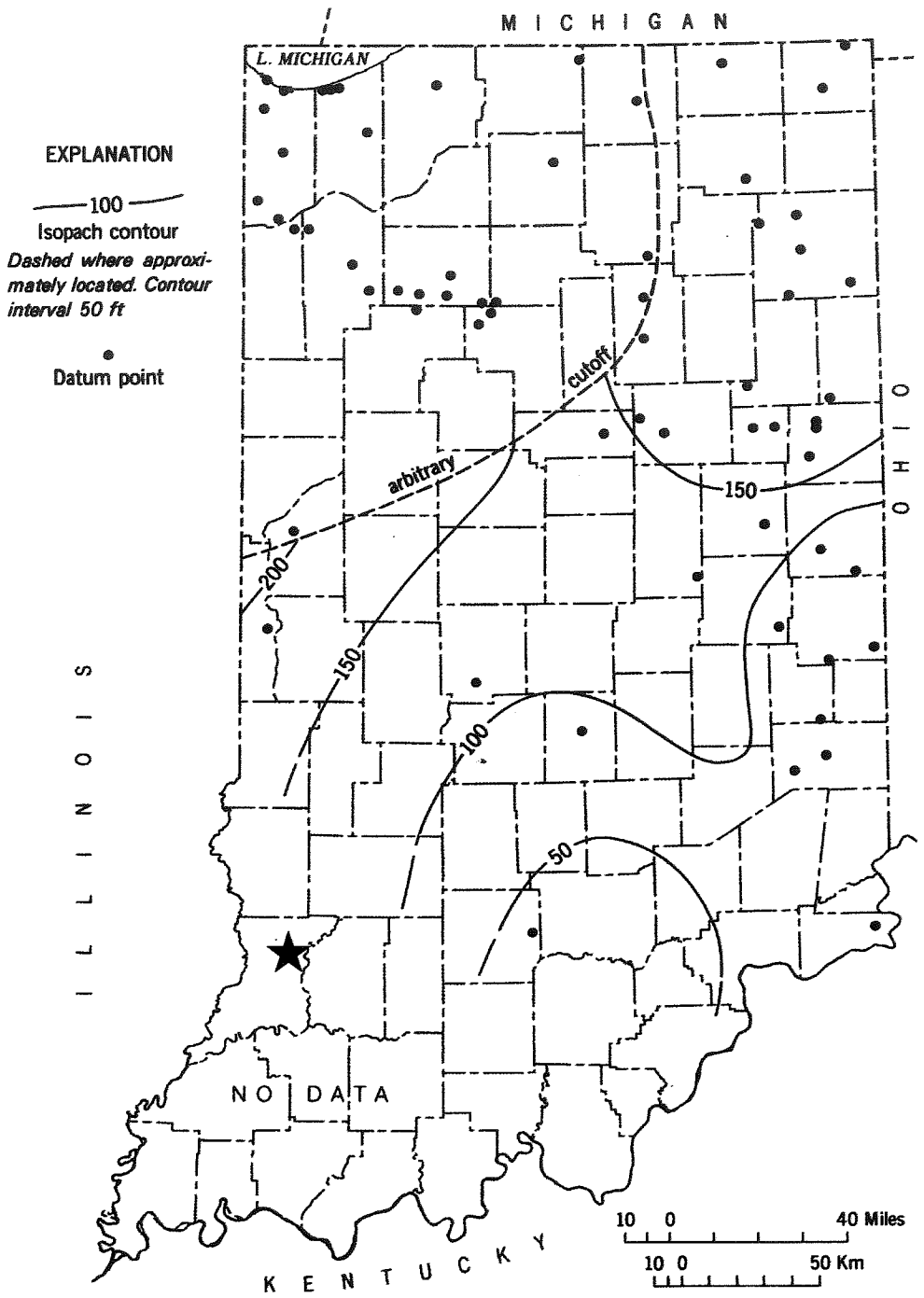
FIGURE F.2.2–2

DUKE ENERGY

EDWARDSPORT FACILITY

MAP OF INDIANA SHOWING
THICKNESS OF THE POTSDAM SUPERGROUP

DATE: 12/11/06	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:



LEGEND

★ SITE LOCATION

N

SOURCE: BECKER, HREHA, AND DAWSON, 1978

SUBSURFACE

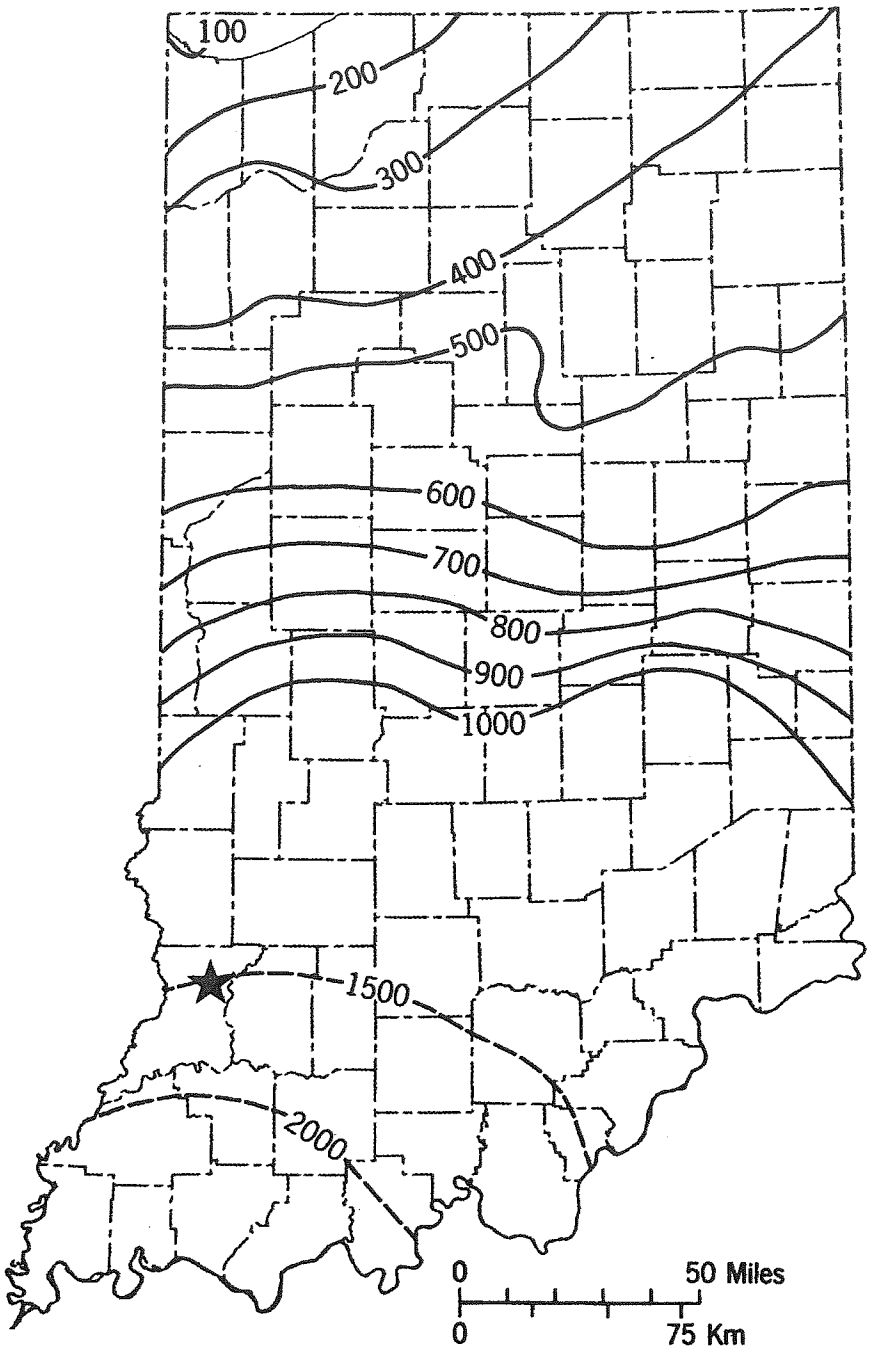
HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

FIGURE F.2.2-3

DUKE ENERGY
EDWARDSPORT FACILITY

MAP OF INDIANA SHOWING
THICKNESS OF THE DAVIS FORMATION

DATE: 12/11/06	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:



Contour interval 100 feet to 1000 feet
and 500 feet above 1000 feet

LEGEND

★ SITE LOCATION

N

SUBSURFACE

HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

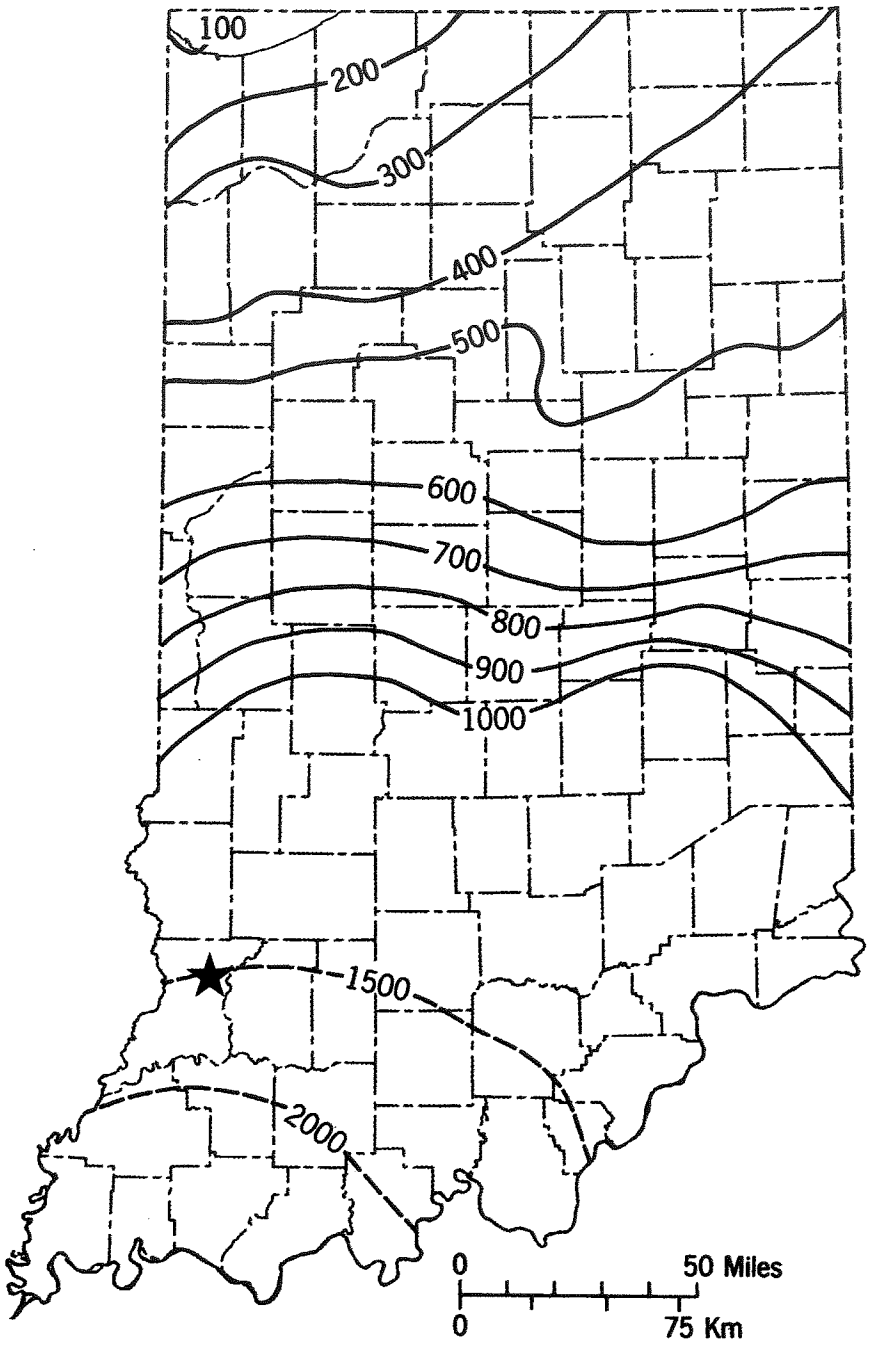
FIGURE F.2.2-4

DUKE ENERGY
EDWARDSPORT FACILITY

MAP OF INDIANA SHOWING
THICKNESS OF THE POTOSI DOLOMITE

DATE: 3/13/08	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:

SOURCE: DROSTE AND PATTON, 1985



LEGEND

★ SITE LOCATION

N

SUBSURFACE

HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

FIGURE F.2.2–4

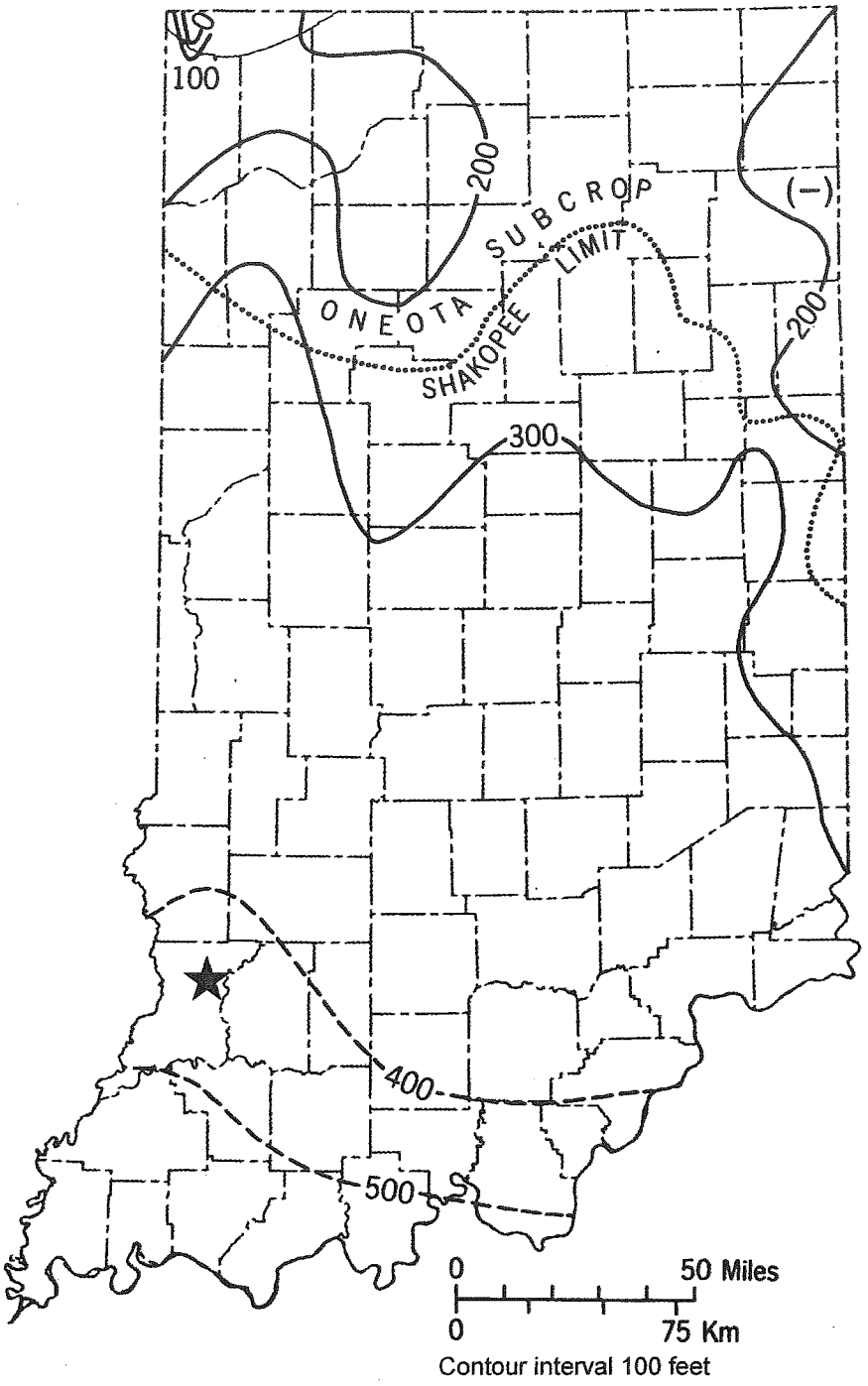
DUKE ENERGY
EDWARDSPORT FACILITY

MAP OF INDIANA SHOWING
THICKNESS OF THE POTOSI DOLOMITE

DATE: 12/11/06	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:

SOURCE: DROSTE AND PATTON, 1985

APR 2008



LEGEND

★ SITE LOCATION

N

SOURCE: DROSTE AND PATTON, 1985

SUBSURFACE

HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

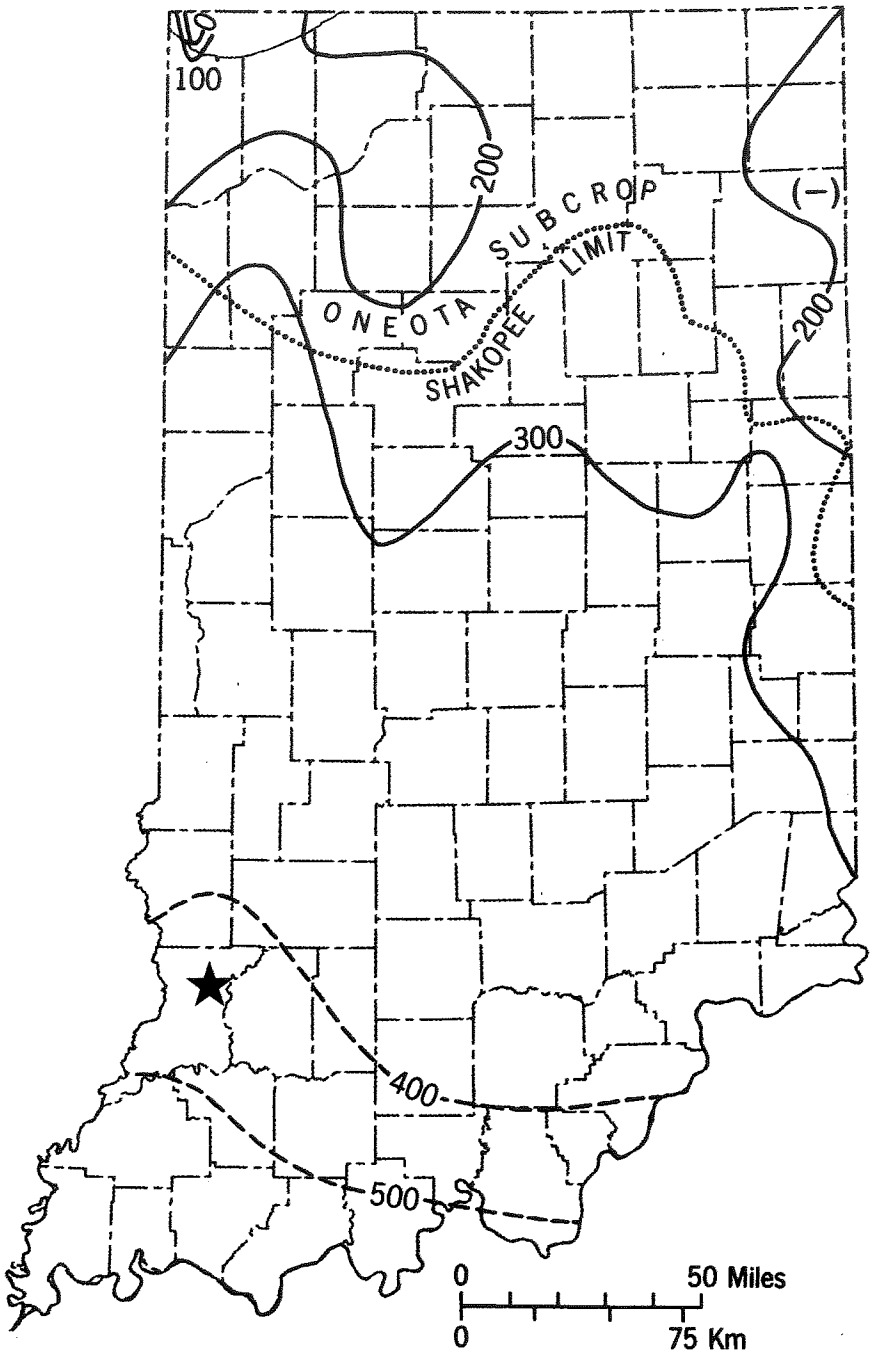
FIGURE F.2.3-1

DUKE ENERGY
EDWARDSPORT FACILITY

MAP OF INDIANA SHOWING
THICKNESS OF THE ONEOTA DOLOMITE

DATE: 3/13/08	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:

MAR 2007



LEGEND

★ SITE LOCATION

N

SOURCE: DROSTE AND PATTON, 1985

SUBSURFACE

HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

FIGURE F.2.3–1

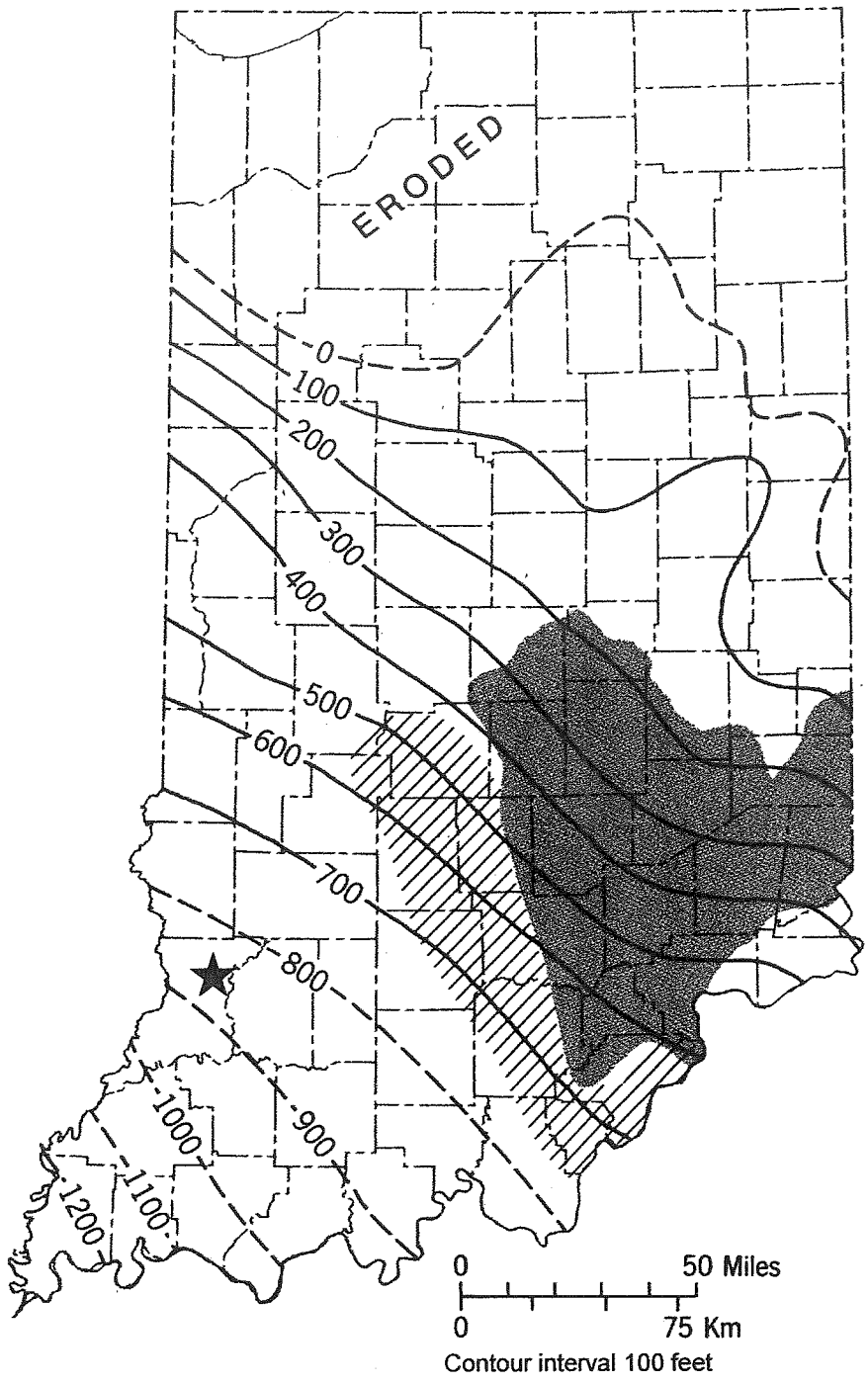
DUKE ENERGY

EDWARDSPORT FACILITY

MAP OF INDIANA SHOWING
THICKNESS OF THE ONEOTA DOLOMITE

DATE: 12/11/06	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:

APR 2008



LEGEND

★ SITE LOCATION

GRAY TONE INDICATES THE AREA WHERE SANDSTONES OF THE SHAKOPEE DOLOMITE LIE DIRECTLY BELOW ROCKS OF THE ANCELL GROUP AND WHERE THEY ARE PROMINENT ROCKS IN THE LOWER SHAKOPEE. LINE PATTERN INDICATES THE AREA WHERE SANDSTONES ARE PROMINENT ROCKS IN THE SHAKOPEE DOLOMITE BELOW THE TOP OF THE UNIT.

N

SOURCE: DROSTE AND PATTON, 1985

SUBSURFACE

HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

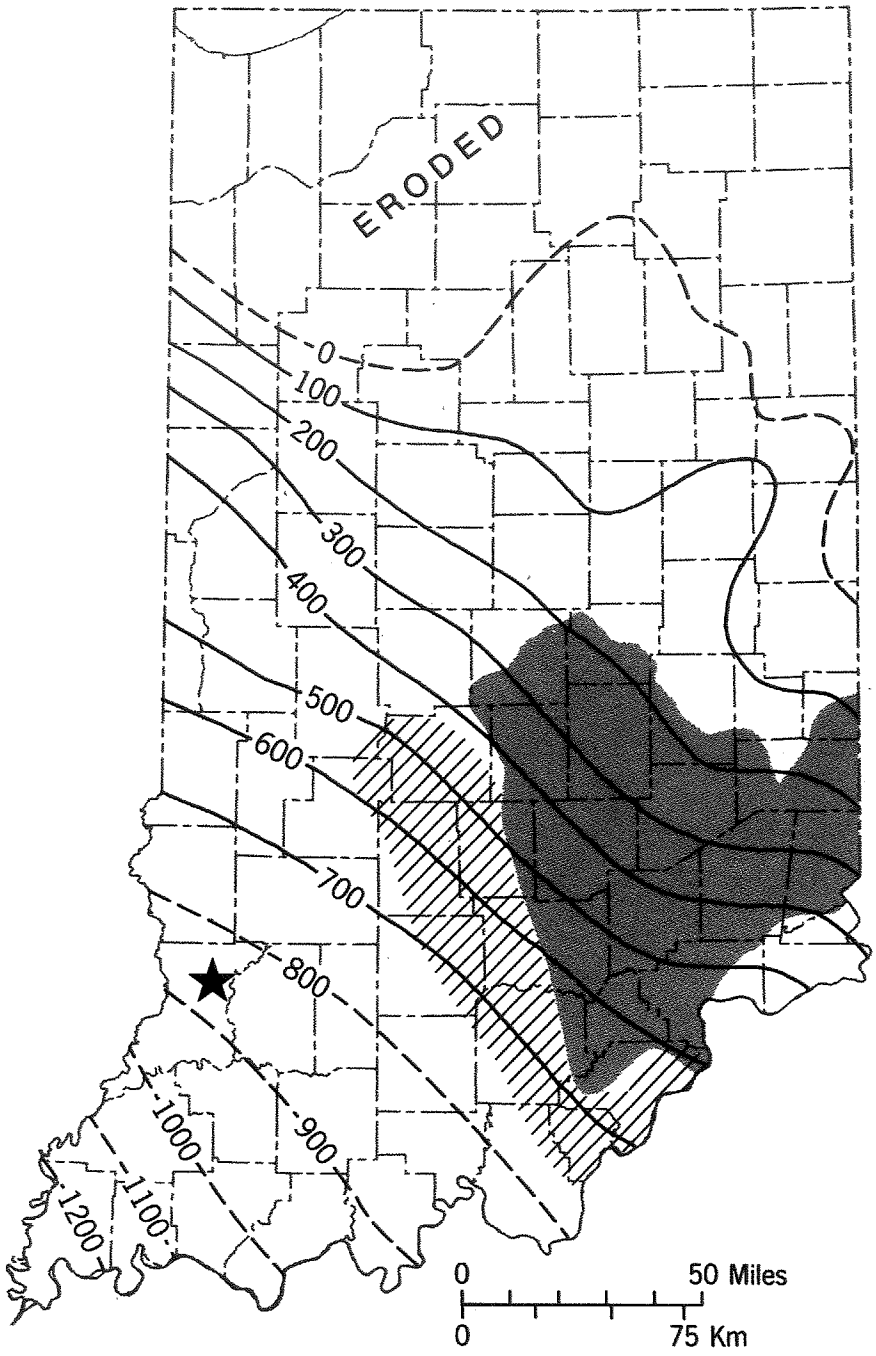
FIGURE F.2.3-2

DUKE ENERGY
EDWARDSPORT FACILITY

MAP OF INDIANA SHOWING
THICKNESS OF THE SHAKOPEE DOLOMITE

DATE: 3/13/08	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:

MAR — 2007



LEGEND

★ SITE LOCATION

N

SUBSURFACE

HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

FIGURE F.2.3-2

DUKE ENERGY

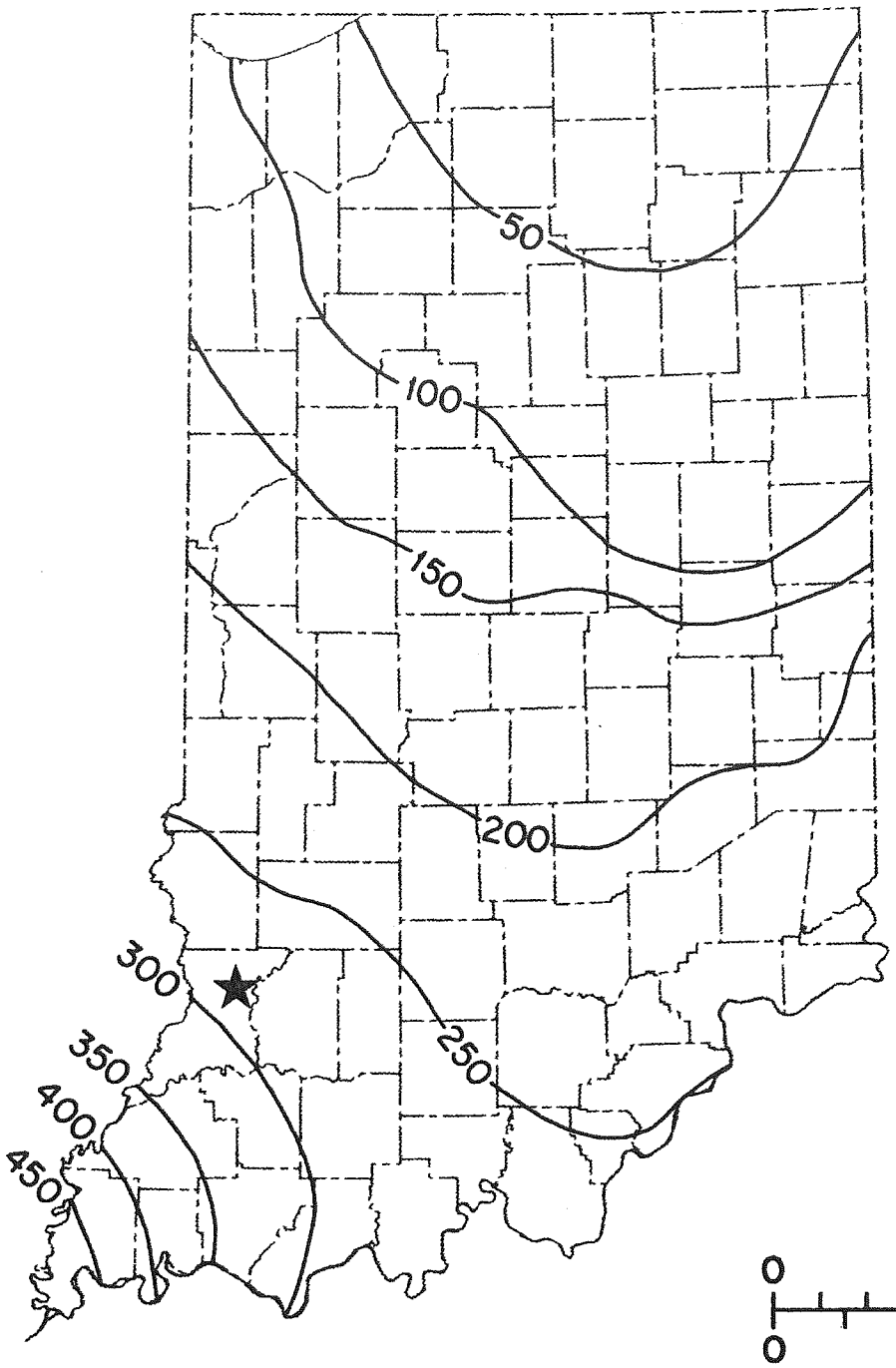
EDWARDSPORT FACILITY

MAP OF INDIANA SHOWING
THICKNESS OF THE SHAKOPEE DOLOMITE

DATE: 12/11/06	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:

SOURCE: DROSTE AND PATTON, 1985

APR _ _ 2008



0 50 Miles

0 75 Km

Contour interval 50 feet

LEGEND

★ SITE LOCATION

N

SOURCE: DROSTE, ABDULKAREEM, AND PATTON, 1982

SUBSURFACE

HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

FIGURE F.2.3-3

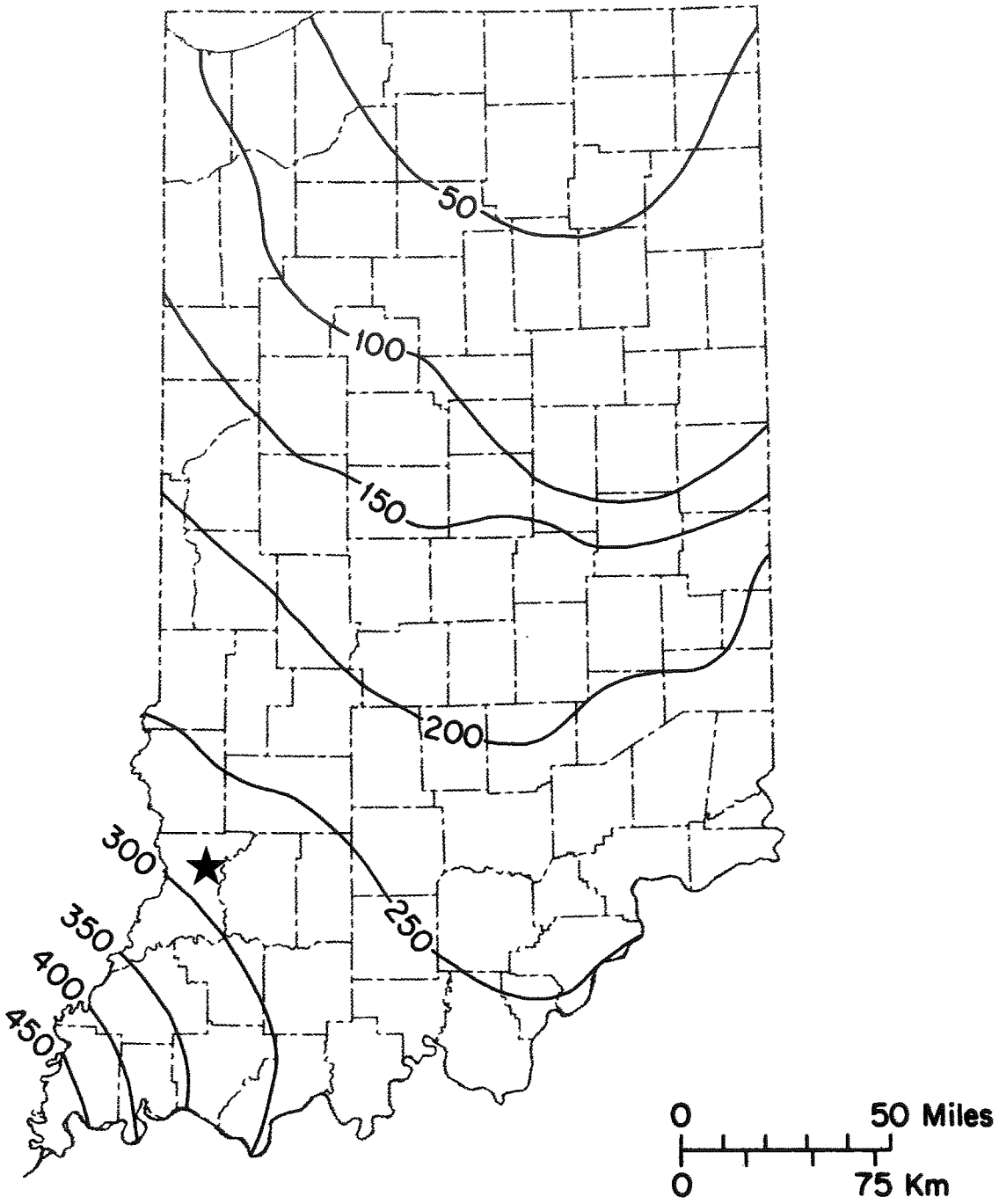
DUKE ENERGY

EDWARDSPORT FACILITY

MAP OF INDIANA SHOWING
THICKNESS OF THE ANCELL GROUP

DATE: 3/13/08	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:

MAR — 2007



LEGEND

★ SITE LOCATION

N

SOURCE: DROSTE, ABDULKAREEM, AND PATTON, 1982

SUBSURFACE

HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

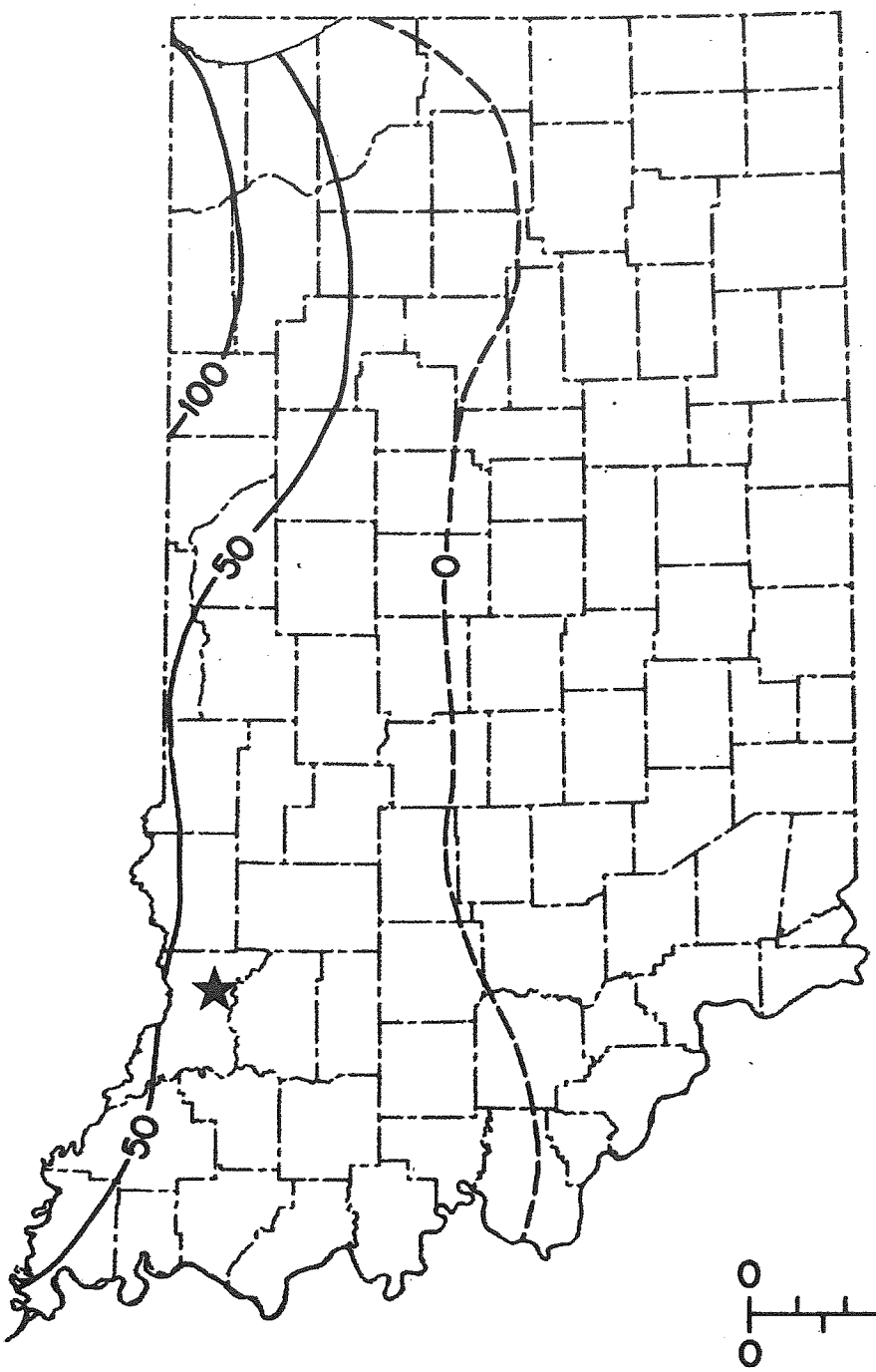
FIGURE F.2.3-3

DUKE ENERGY

EDWARDSPORT FACILITY

MAP OF INDIANA SHOWING
THICKNESS OF THE ANCELL GROUP

DATE: 12/11/06	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:



0 50 Miles

0 75 Km

Contour interval 50 feet

LEGEND

★ SITE LOCATION

N

SOURCE: DROSTE, ABDULKAREEM, AND PATTON, 1982

SUBSURFACE

HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

FIGURE F.2.3–4

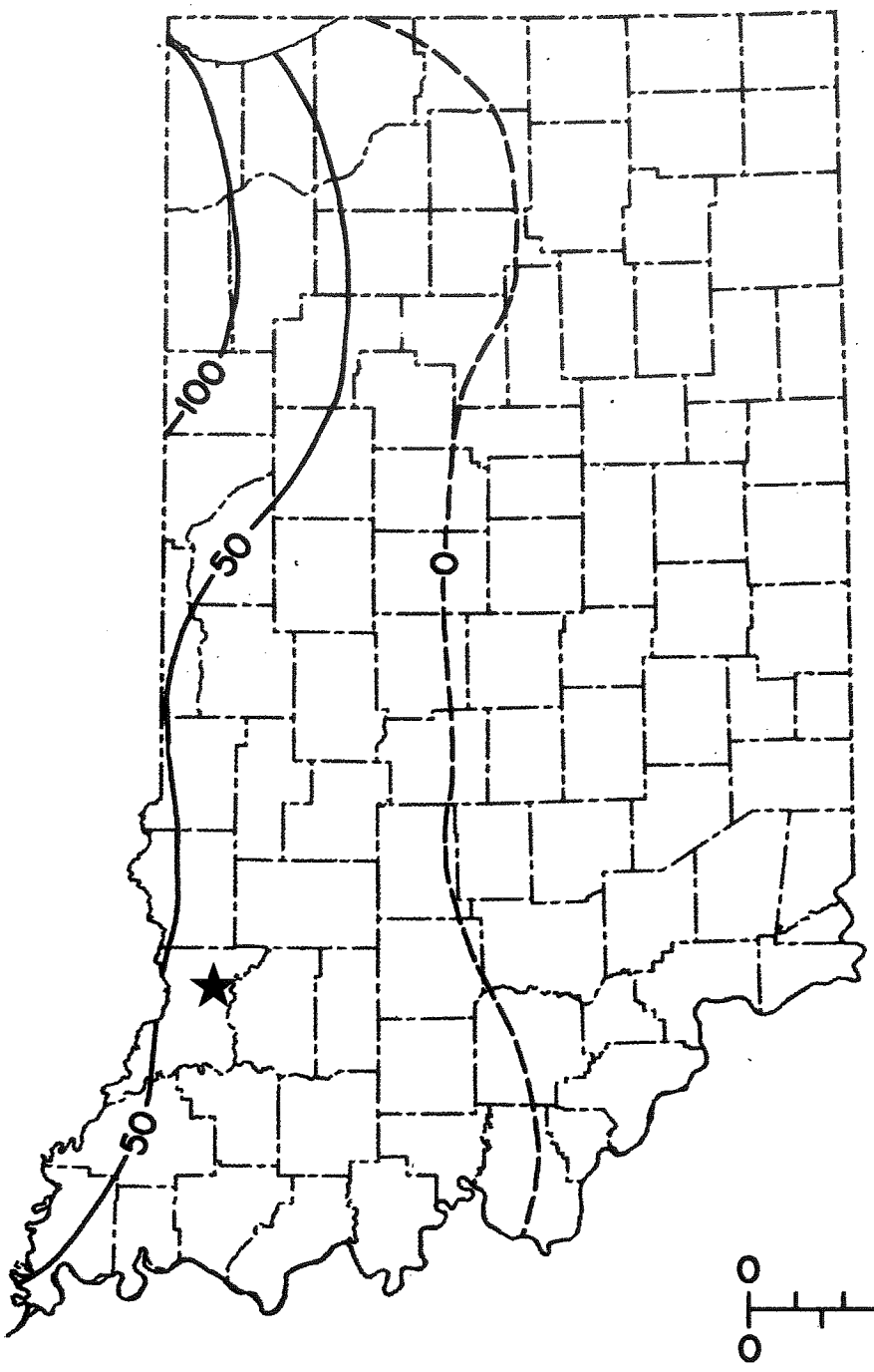
DUKE ENERGY

EDWARDSPORT FACILITY

MAP OF INDIANA SHOWING
THICKNESS OF THE ST. PETER SANDSTONE

DATE: 3/13/08	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:

2007



LEGEND

★ SITE LOCATION

N

SOURCE: DROSTE, ABDULKAREEM, AND PATTON, 1982

SUBSURFACE

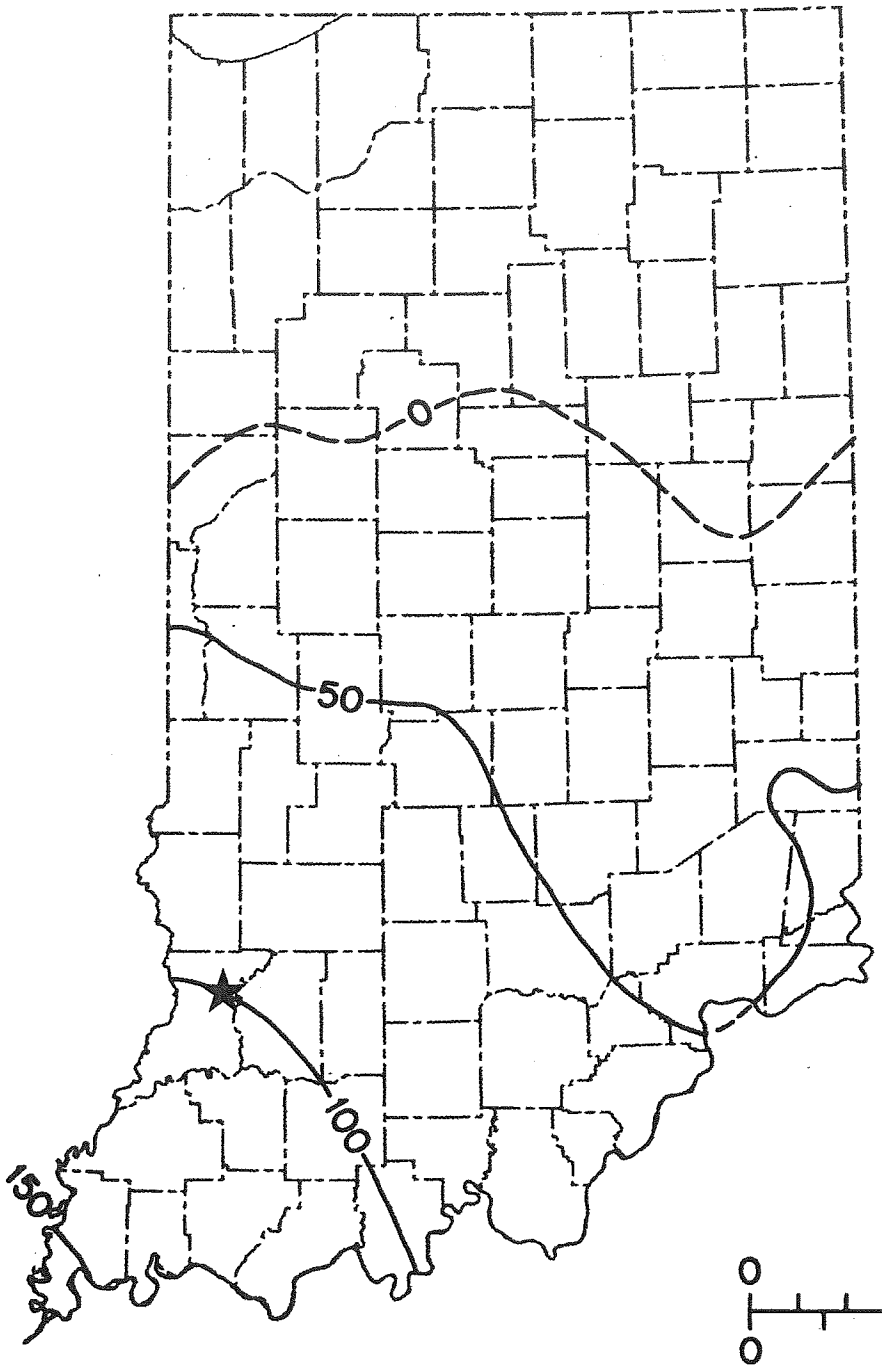
HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

FIGURE F.2.3–4

DUKE ENERGY
EDWARDSPORT FACILITY

MAP OF INDIANA SHOWING
THICKNESS OF THE ST. PETER SANDSTONE

DATE: 12/11/06	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:



0 50 Miles

0 75 Km

Contour interval 50 feet

LEGEND

★ SITE LOCATION

N

SOURCE: DROSTE, ABDULKAREEM, AND PATTON, 1982

SUBSURFACE

HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

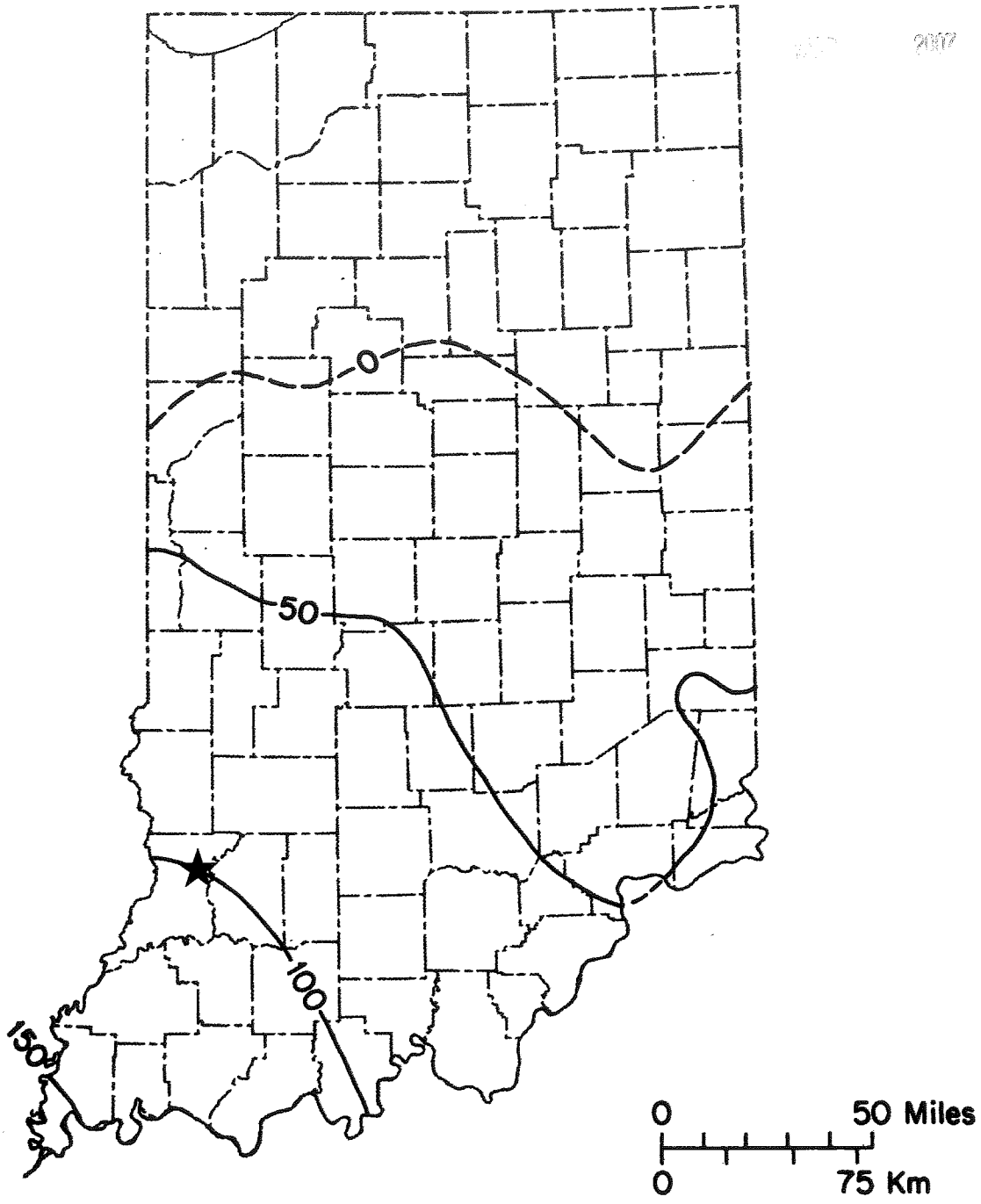
FIGURE F.2.3-5

DUKE ENERGY

EDWARDSPORT FACILITY

MAP OF INDIANA SHOWING
THICKNESS OF THE DUTCHTOWN FORMATION

DATE: 3/13/08	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:



LEGEND

★ SITE LOCATION

N

SOURCE: DROSTE, ABDULKAREEM, AND PATTON, 1982

SUBSURFACE

HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

FIGURE F.2.3-5

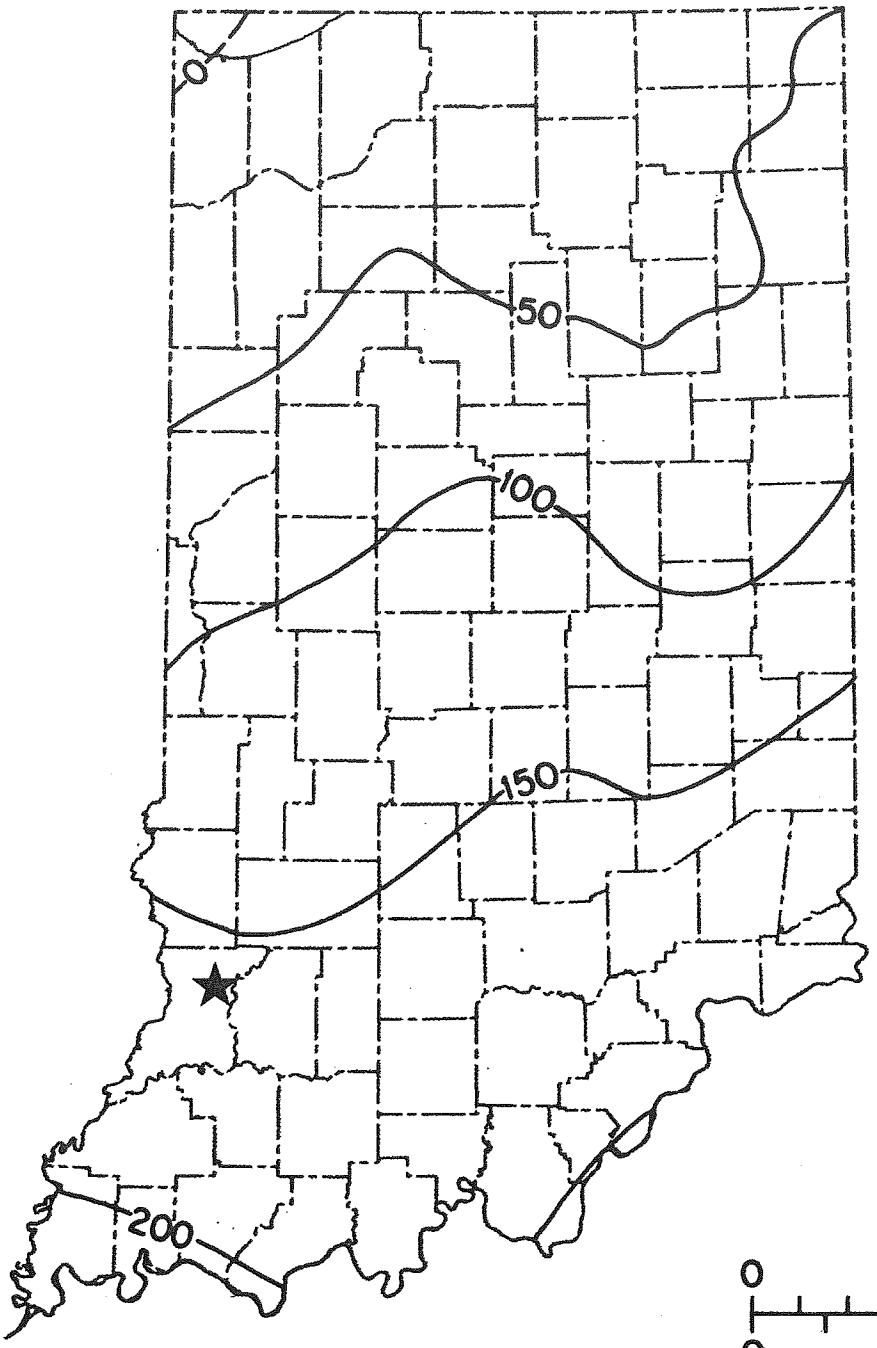
DUKE ENERGY

EDWARDSPORT FACILITY

MAP OF INDIANA SHOWING
THICKNESS OF THE DUTCHTOWN FORMATION

DATE: 12/11/06	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:

APR 2008



0 50 Miles

0 75 Km

Contour interval 50 feet

LEGEND

★ SITE LOCATION

N

SOURCE: DROSTE, ABDULKAREEM, AND PATTON, 1982

SUBSURFACE

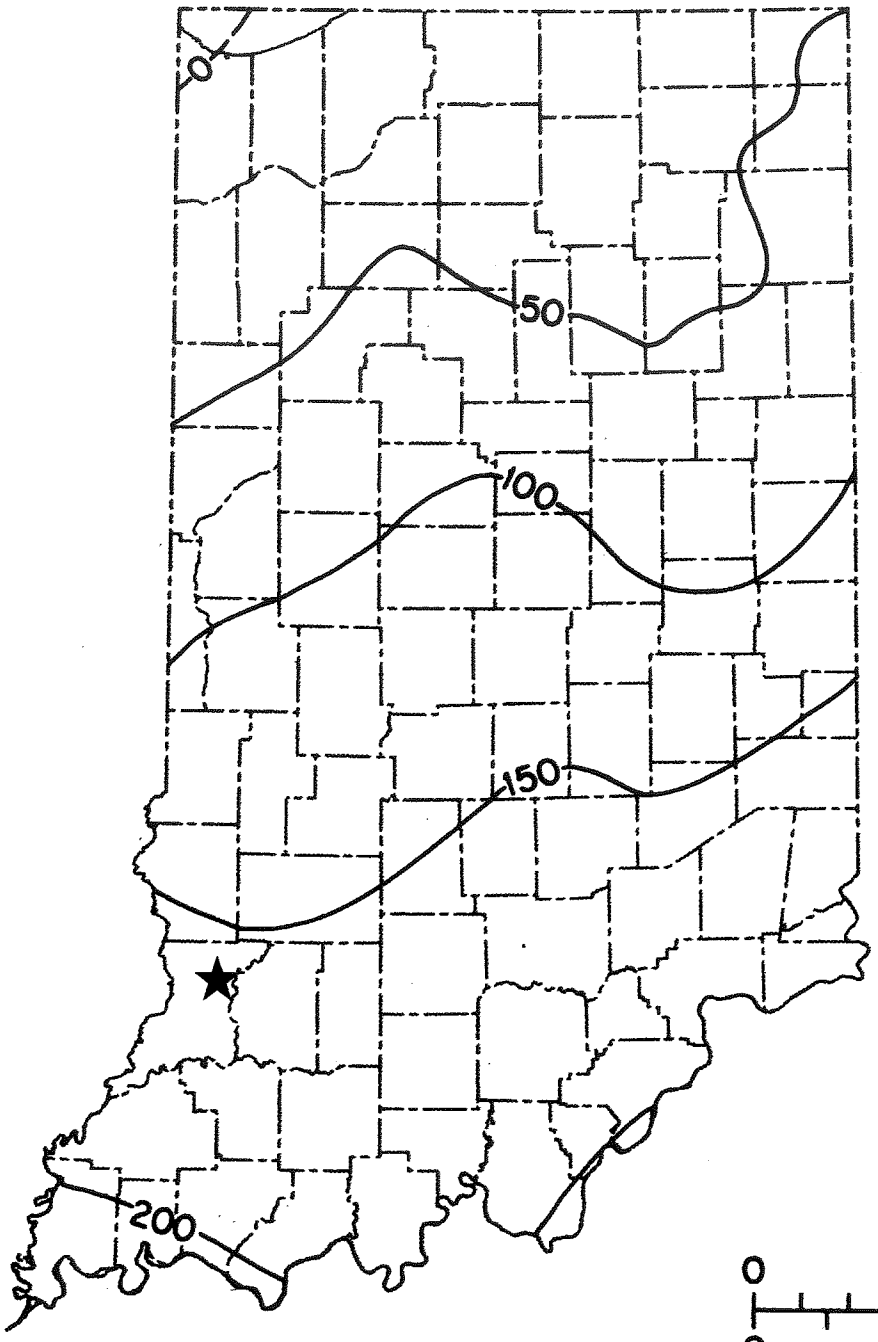
HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

FIGURE F.2.3-6

DUKE ENERGY
EDWARDSPORT FACILITY

MAP OF INDIANA SHOWING
THICKNESS OF THE JAOCHIM FORMATION

DATE: 3/13/08	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:



LEGEND

★ SITE LOCATION

SOURCE: DROSTE, ABDULKAREEM, AND PATTON, 1982

SUBSURFACE

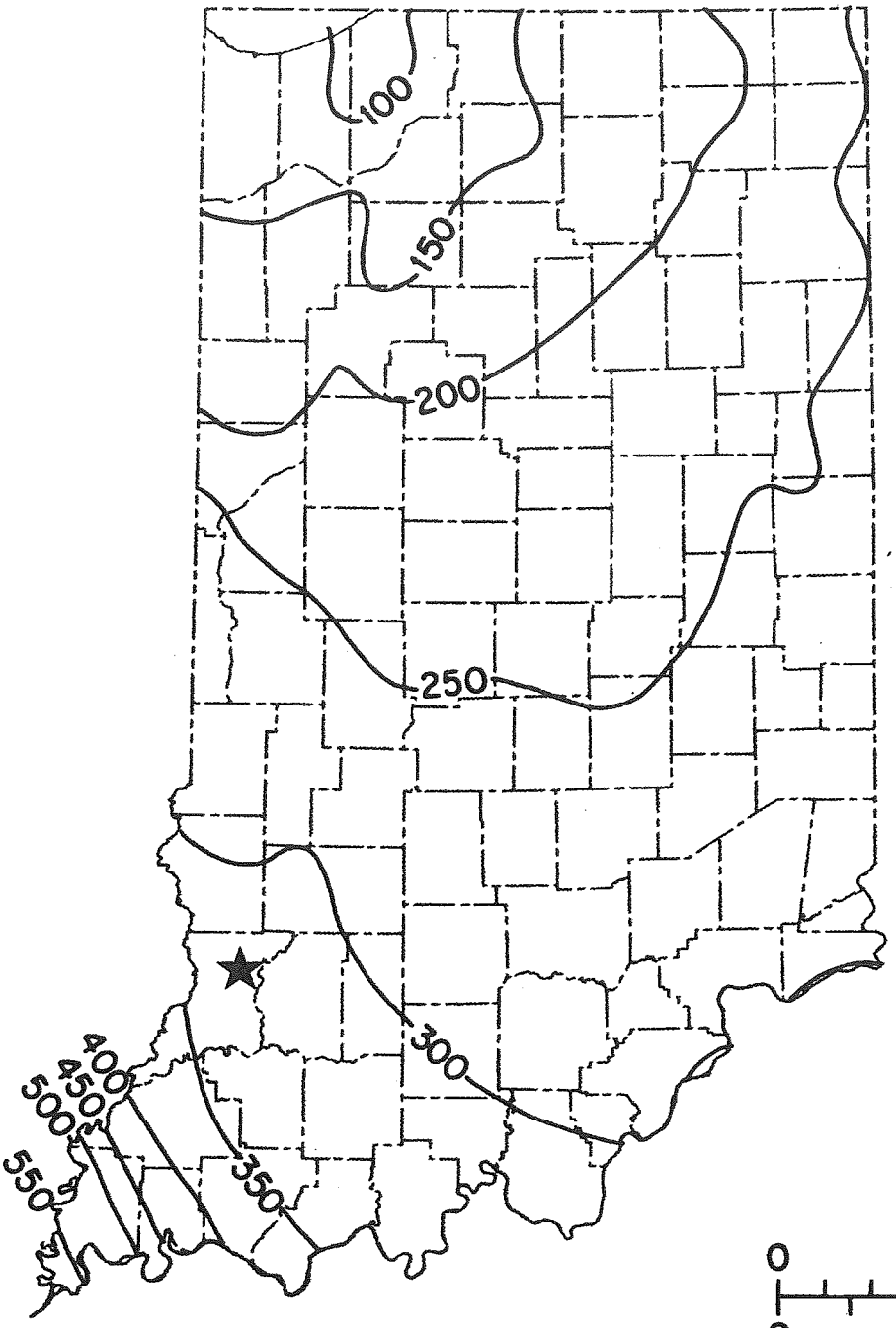
HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

FIGURE F.2.3–6

DUKE ENERGY
EDWARDSPORT FACILITY

MAP OF INDIANA SHOWING
THICKNESS OF THE JAOCHIM FORMATION

DATE: 12/11/06	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:



0 50 Miles

0 75 Km

Contour interval 50 feet

LEGEND

★ SITE LOCATION

N

SUBSURFACE

HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

FIGURE F.2.3-7

DUKE ENERGY

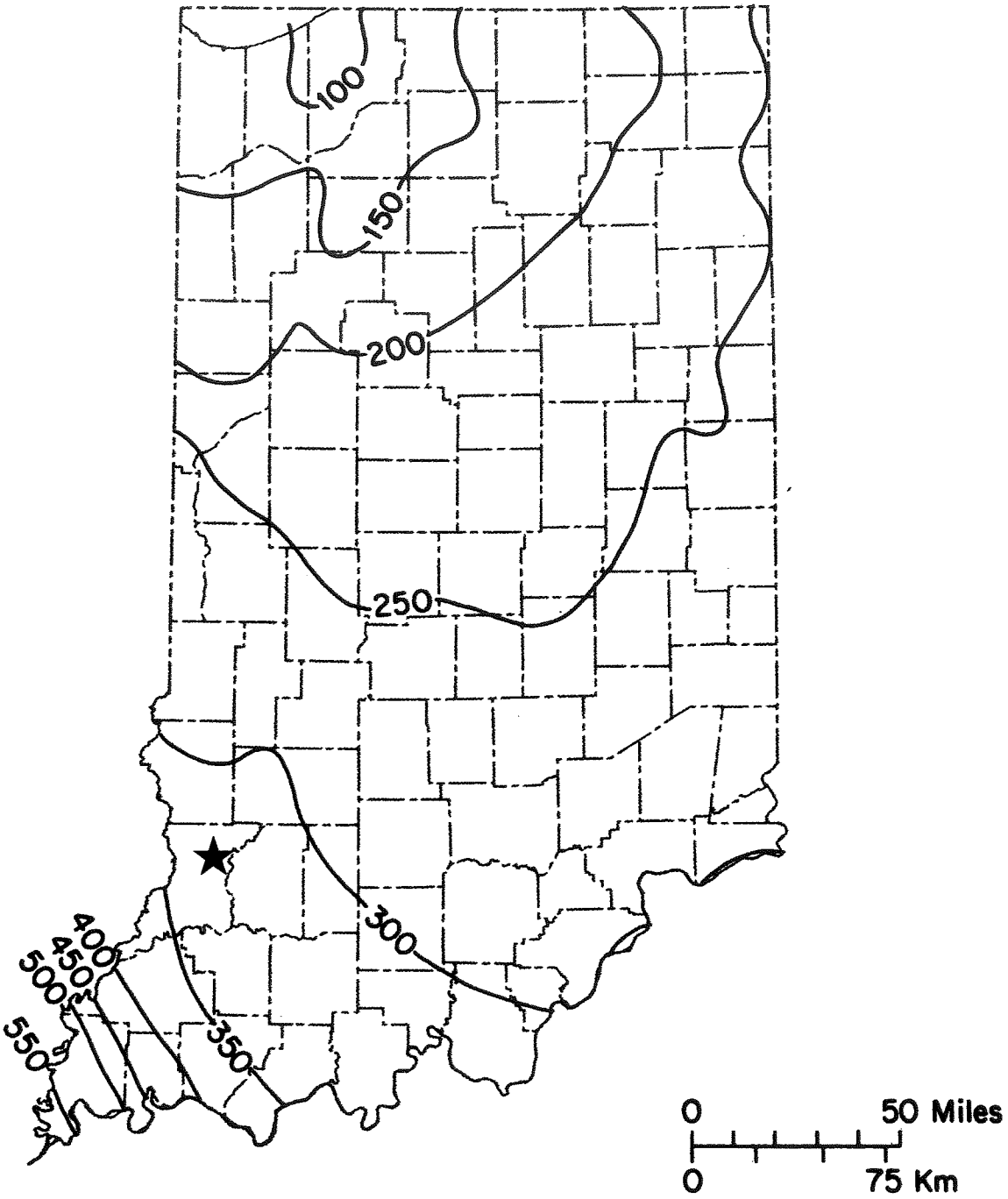
EDWARDSPORT FACILITY

MAP OF INDIANA SHOWING
THICKNESS OF THE BLACK RIVER GROUP

DATE: 3/13/08	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:

SOURCE: DROSTE, ABDULKAREEM, AND PATTON, 1982

MAR 2007



LEGEND

★ SITE LOCATION

N

SOURCE: DROSTE, ABDULKAREEM, AND PATTON, 1982

SUBSURFACE

HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

FIGURE F.2.3–7

DUKE ENERGY
EDWARDSPORT FACILITY

MAP OF INDIANA SHOWING
THICKNESS OF THE BLACK RIVER GROUP

DATE: 12/11/06	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:

APR 2008

0 50 Miles

0 75 Km

Contour interval 25 feet

LEGEND

★ SITE LOCATION

N

SOURCE: DROSTE, ABDULKAREEM, AND PATTON, 1982

SUBSURFACE

HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

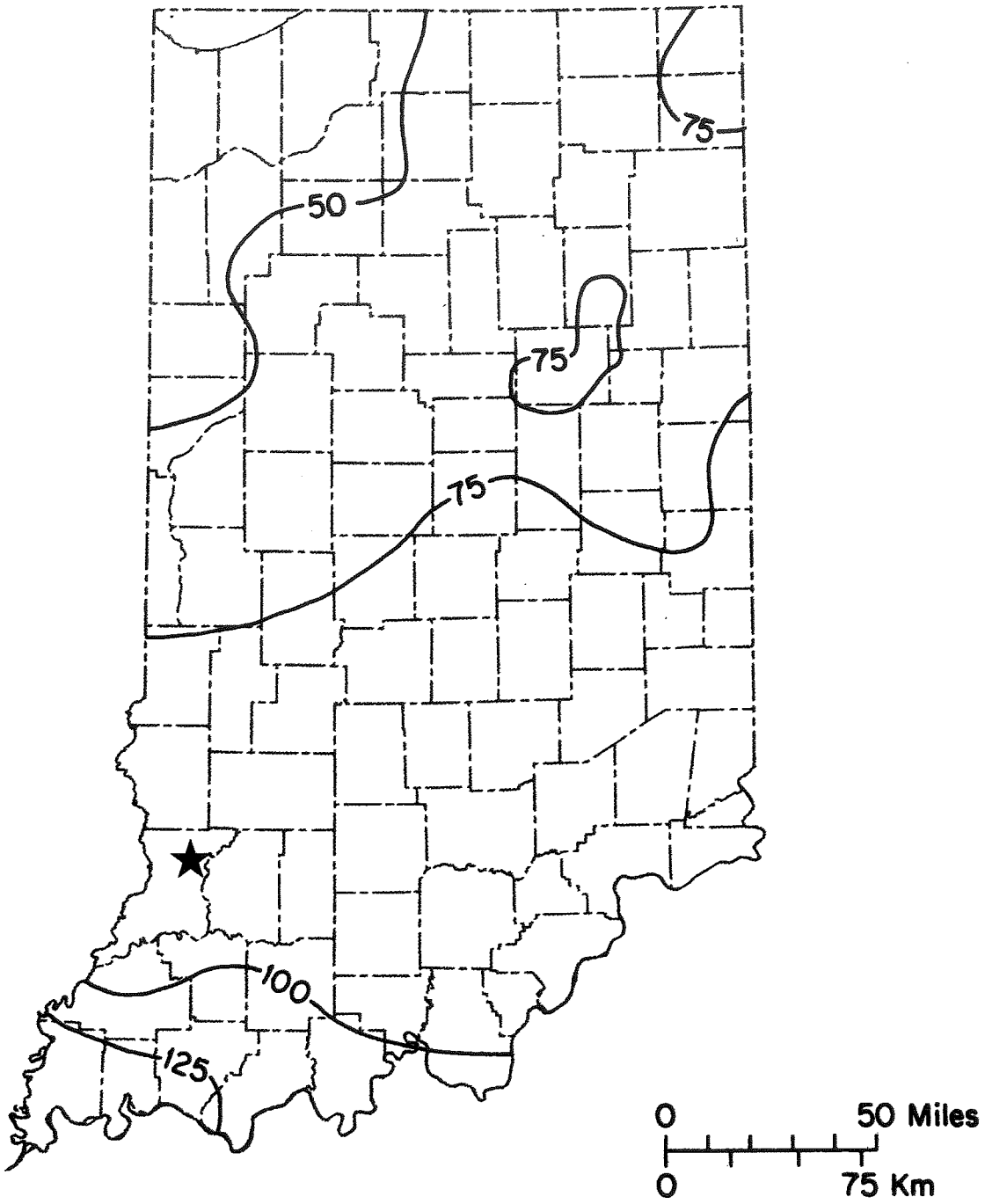
FIGURE F.2.3-8

PSI ENERGY, INC.

EDWARDSPORT FACILITY

MAP SHOWING THE THICKNESS OF THE PECATONICA FORMATION IN INDIANA

DATE: 3/13/08	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:



LEGEND

★ SITE LOCATION

N

SOURCE: DROSTE, ABDULKAREEM, AND PATTON, 1982

SUBSURFACE

HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

FIGURE F.2.3-8

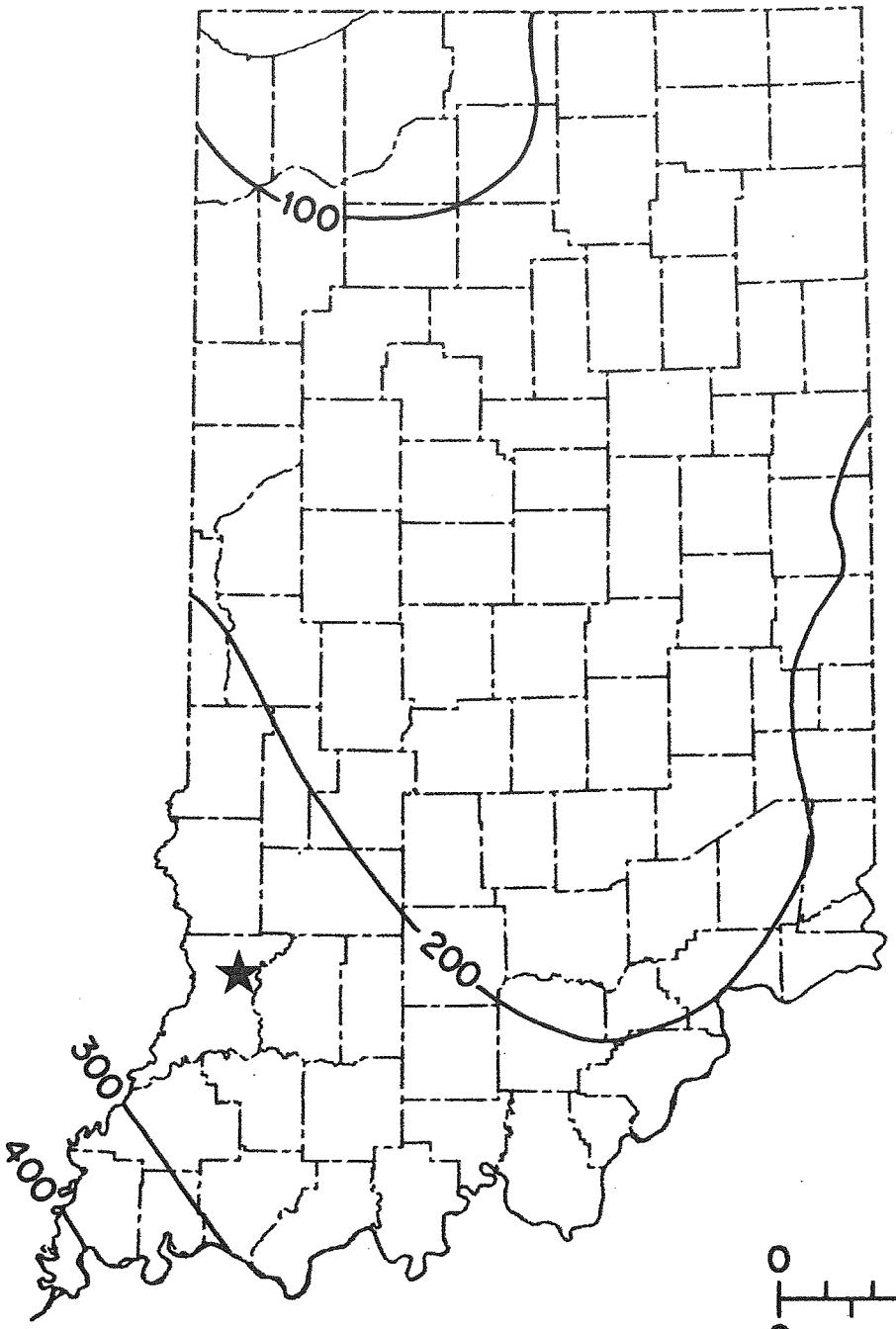
PSI ENERGY, INC.

EDWARDSPORT FACILITY

MAP SHOWING THE THICKNESS OF THE PECATONICA FORMATION IN INDIANA

DATE: 12/11/06	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:

APR 2008



0 50 Miles

0 75 Km

Contour interval 100 feet

LEGEND

★ SITE LOCATION

N

SOURCE: DROSTE, ABDULKAREEM, AND PATTON, 1982

SUBSURFACE

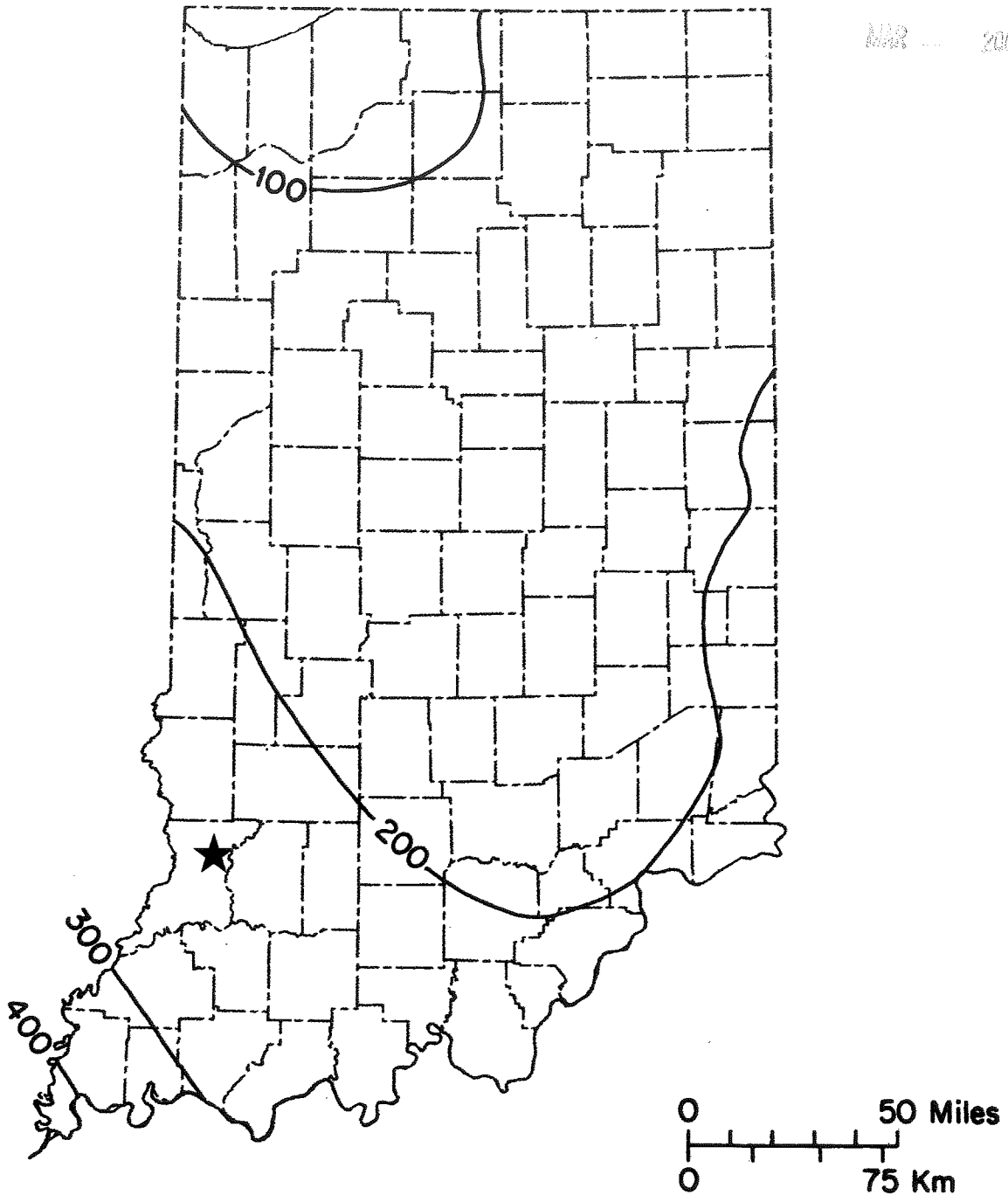
HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

FIGURE F.2.3-9

DUKE ENERGY
EDWARDSPORT FACILITY

MAP OF INDIANA SHOWING
THICKNESS OF THE PLATTIN FORMATION

DATE: 3/13/08	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:



LEGEND

★ SITE LOCATION

N

SOURCE: DROSTE, ABDULKAREEM, AND PATTON, 1982

SUBSURFACE

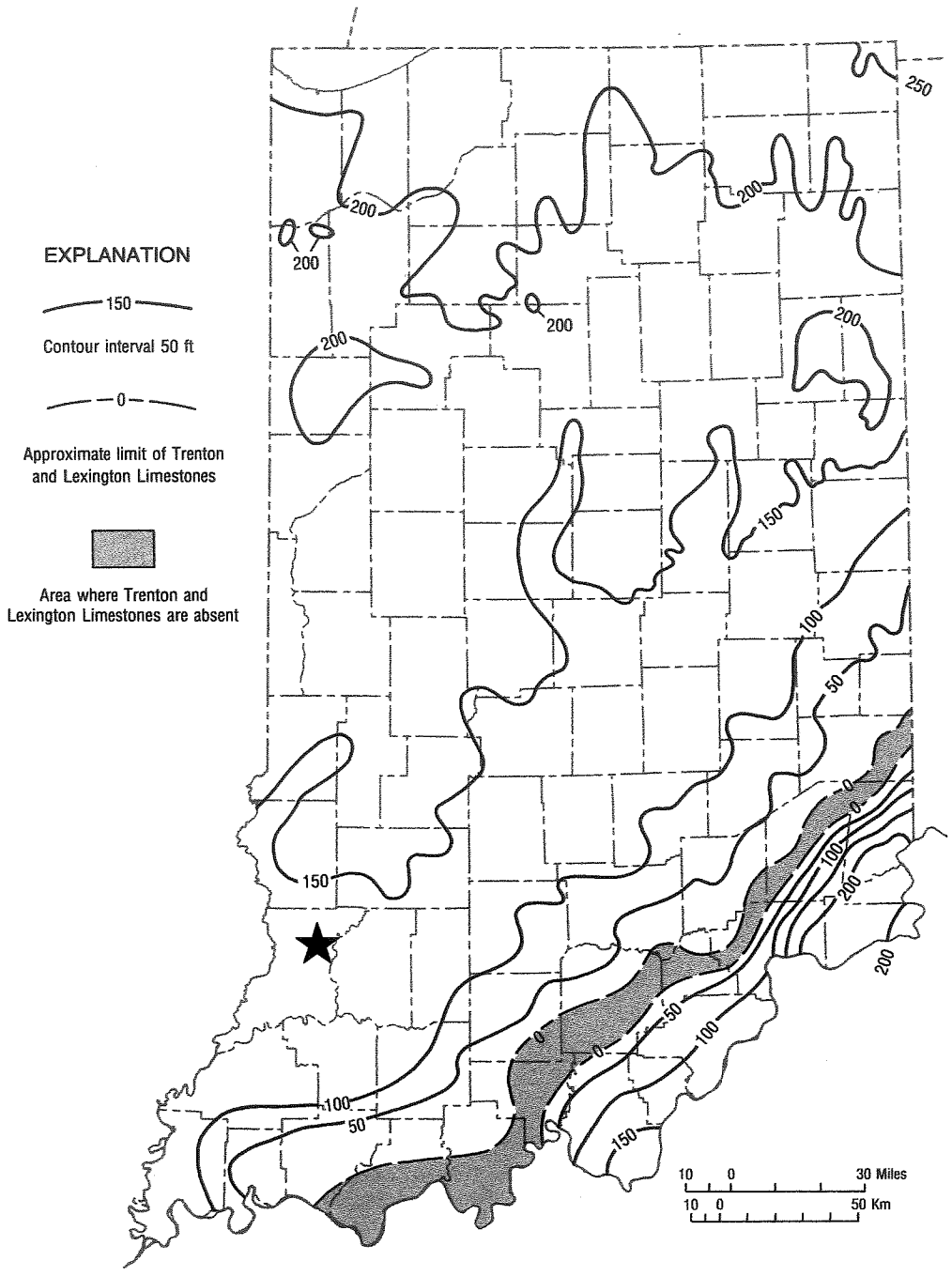
HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

FIGURE F.2.3-9

DUKE ENERGY
EDWARDSPORT FACILITY

MAP OF INDIANA SHOWING
THICKNESS OF THE PLATTIN FORMATION

DATE: 12/11/06	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:



LEGEND

★ SITE LOCATION

N

SOURCE: RUPP, 1991

SUBSURFACE

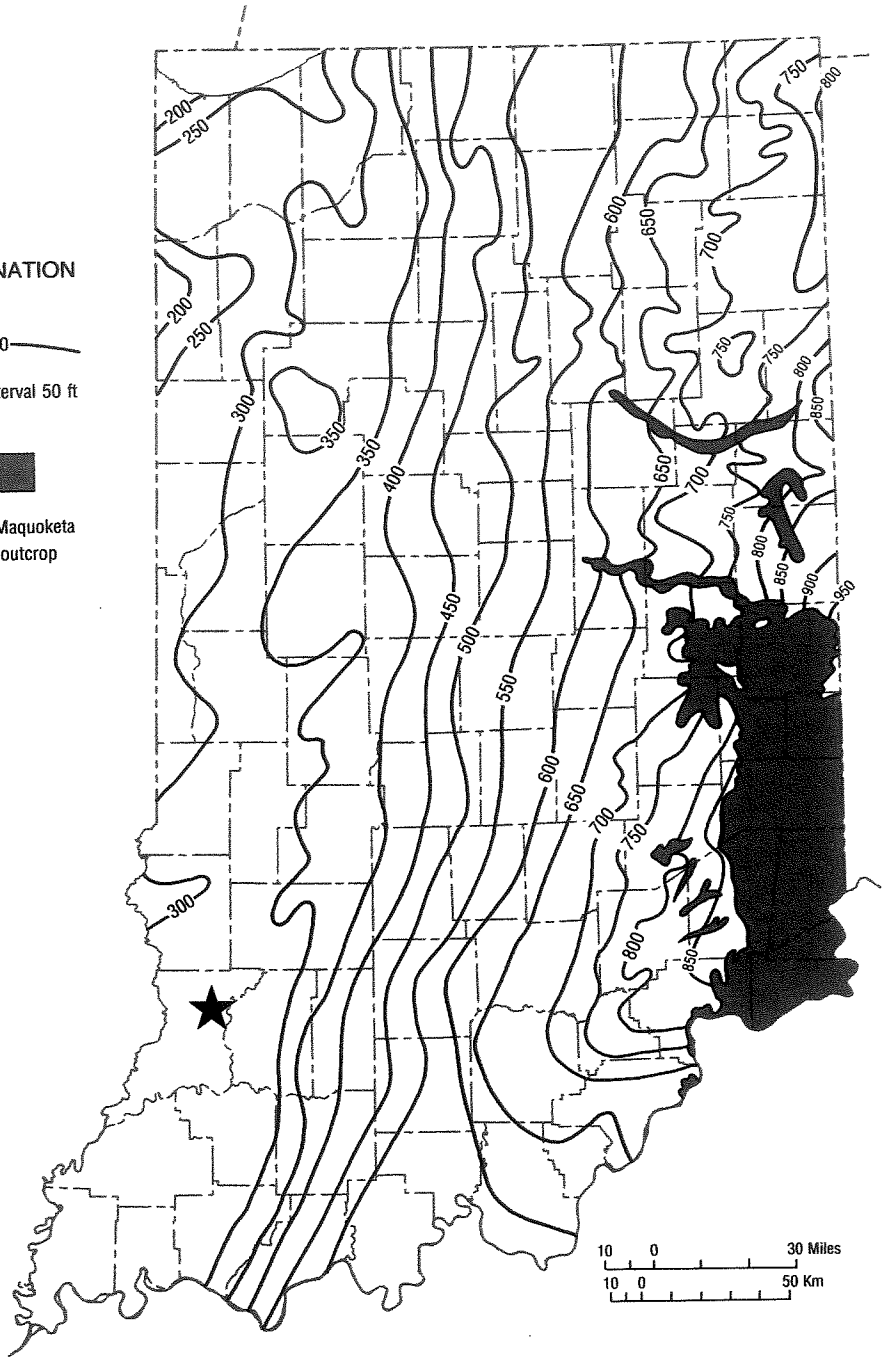
HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

FIGURE F.2.3–10

DUKE ENERGY
EDWARDSPORT FACILITY

MAP OF INDIANA SHOWING THICKNESS OF THE TRENTON AND LEXINGTON LIMESTONE

DATE: 12/11/06	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:



LEGEND

★ SITE LOCATION

N

SOURCE: RUPP, 1991

SUBSURFACE

HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

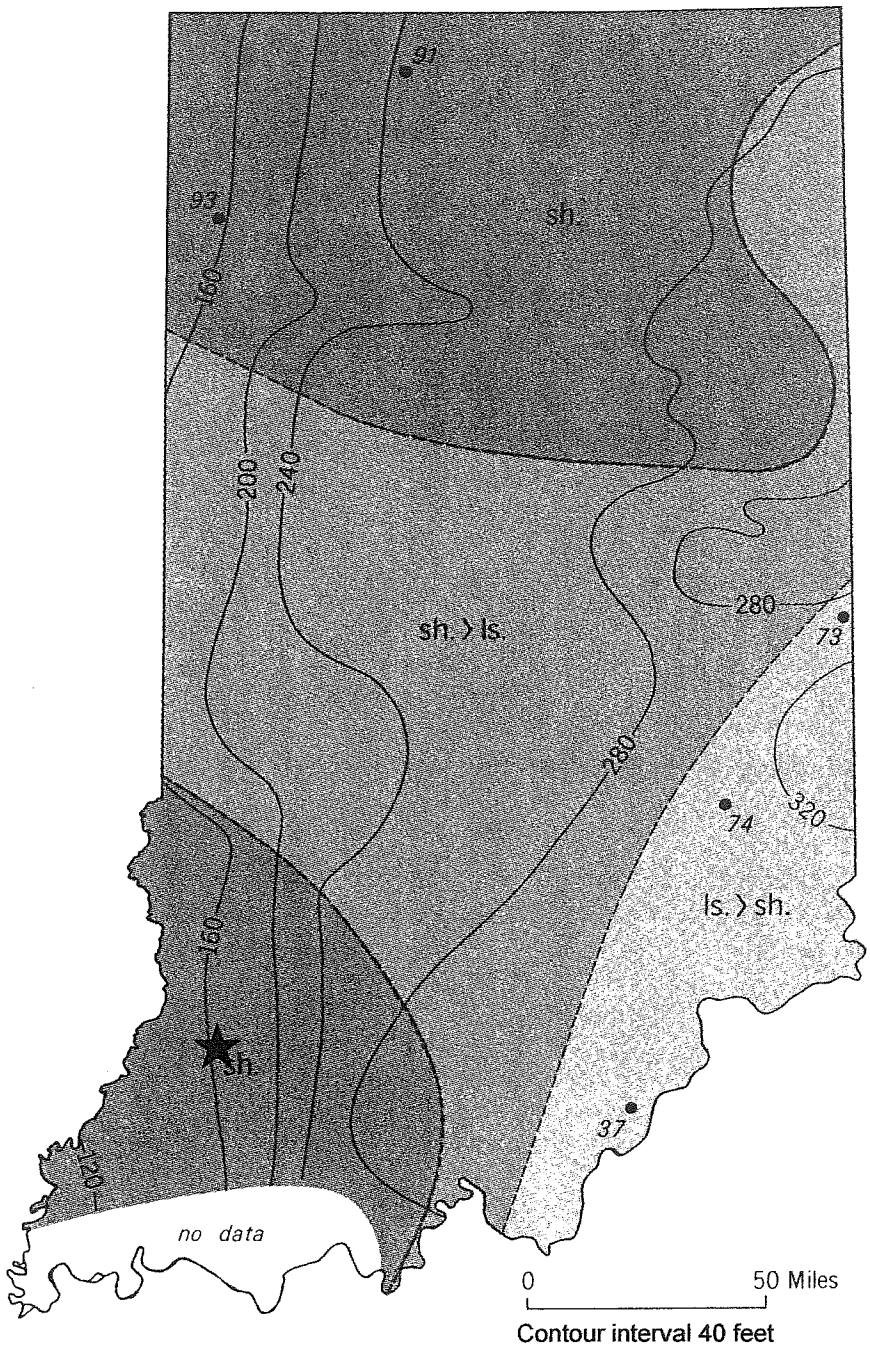
FIGURE F.2.3-11

DUKE ENERGY
EDWARDSPORT FACILITY

MAP OF INDIANA SHOWING
THICKNESS OF THE MAQUOKETA GROUP

DATE: 12/11/06	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:

APR — 2008



LEGEND

★ SITE LOCATION

LITHOFACIES INTERPRETATION IS ESTIMATED FROM CHIP SAMPLE STUDIES. LOCATION OF CORE HOLES IS SHOWN WITH FIGURES GIVING PERCENT OF TERRIGENOUS CLASTIC ROCKS IN INTERVAL AS DETERMINED FROM CORE MEASUREMENTS.

N

SOURCE: GRAY, 1972

SUBSURFACE

HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

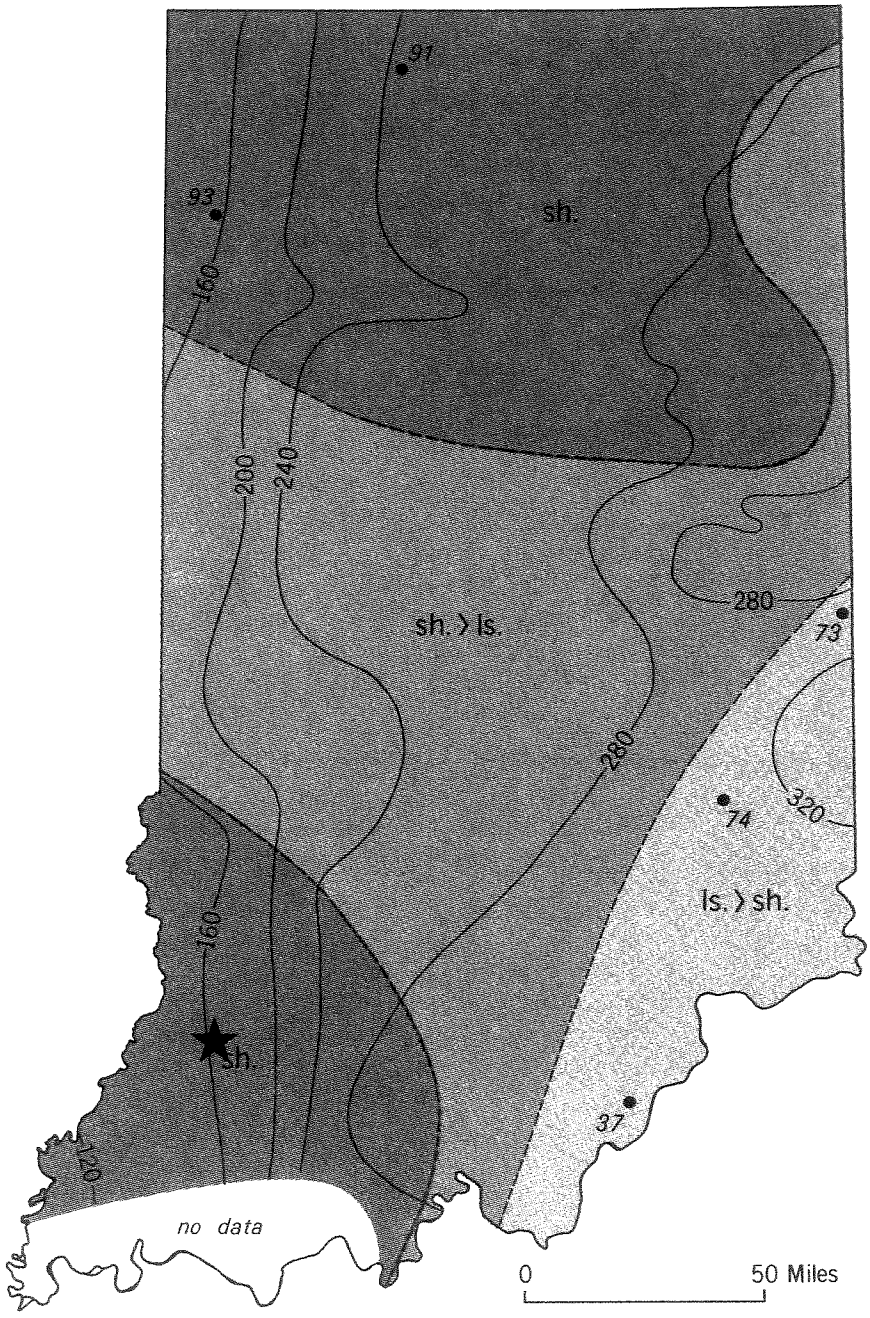
FIGURE F.2.3–12

DUKE ENERGY

EDWARDSPORT FACILITY

MAP OF INDIANA SHOWING THICKNESS AND LITHOFACIES INTERPRETATIONS OF UNIT B, MAQUOKETA GROUP

DATE: 3/13/08	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:



LEGEND

★ SITE LOCATION

N

SUBSURFACE

HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

FIGURE F.2.3-12

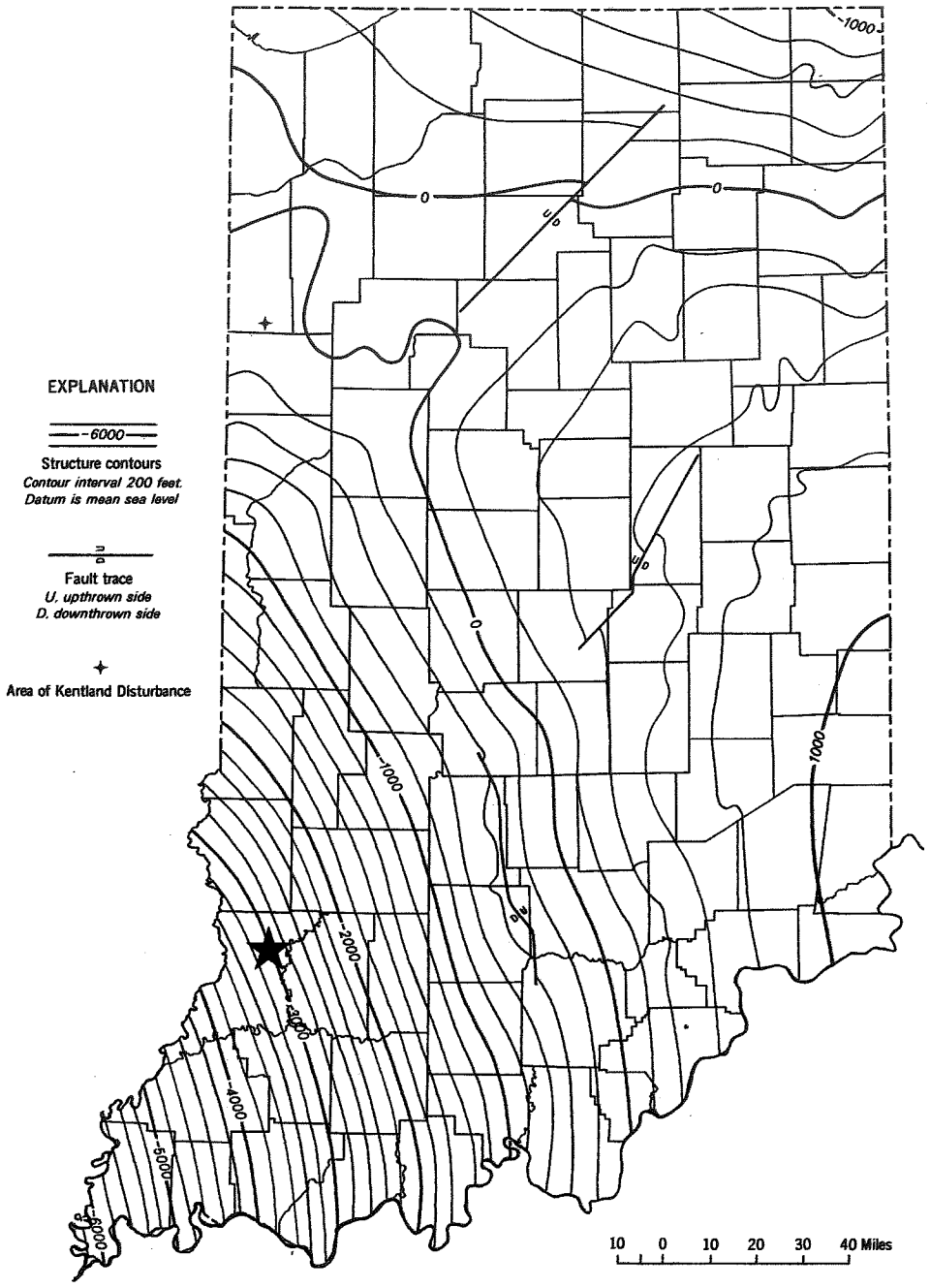
DUKE ENERGY

EDWARDSPORT FACILITY

MAP OF INDIANA SHOWING
THICKNESS AND LITHOFACIES INTERPRETATIONS
OF UNIT B, MAQUOKETA GROUP

DATE: 12/11/06	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:

SOURCE: GRAY, 1972



LEGEND

★ SITE LOCATION

N

SOURCE: GRAY, 1972

SUBSURFACE

HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

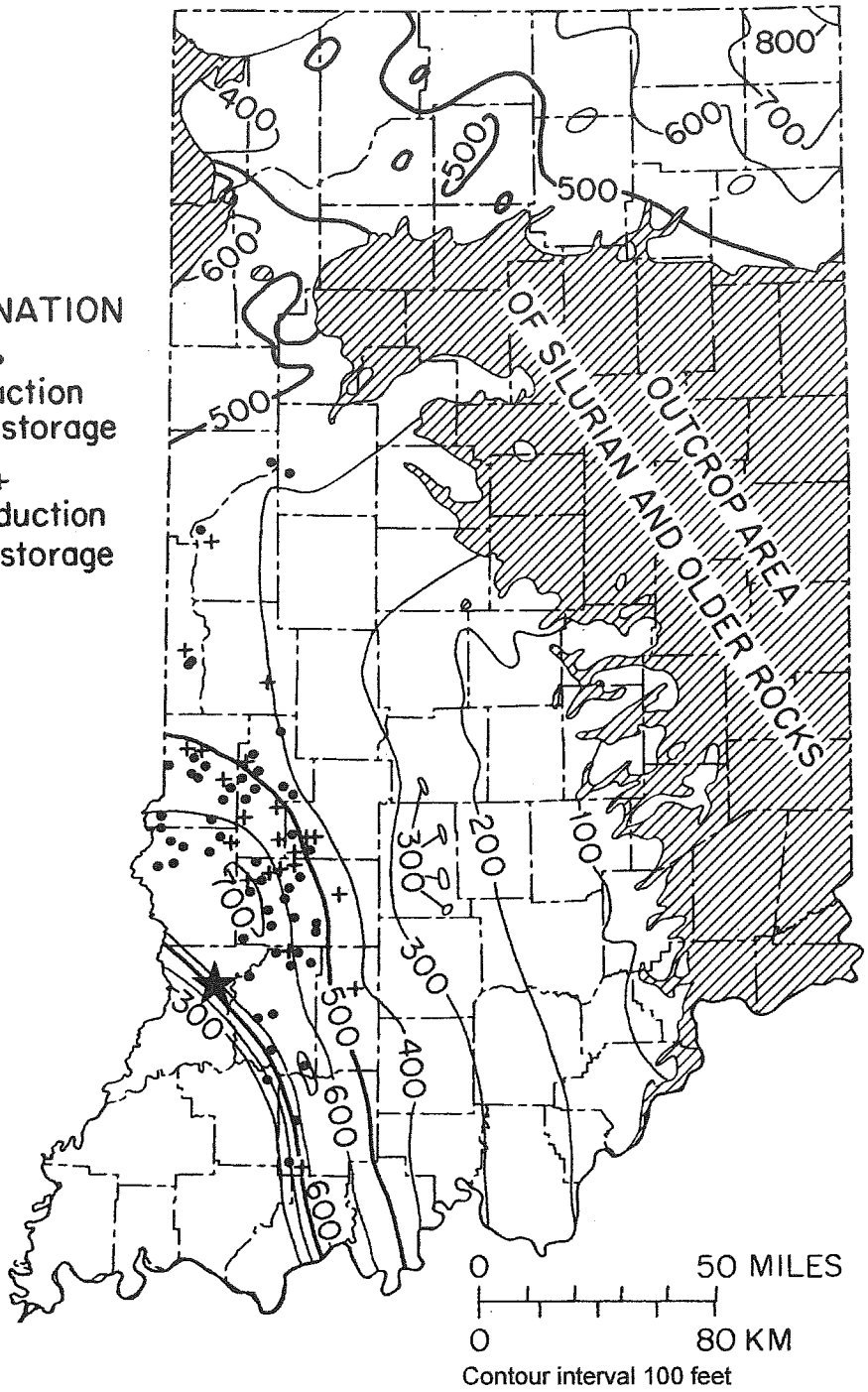
FIGURE F.2.3-13

DUKE ENERGY
EDWARDSPORT FACILITY

MAP OF INDIANA SHOWING STRUCTURE ON TOP OF THE MAQUOKETA GROUP

DATE: 12/11/06	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:

APR — 2008



LEGEND

★ SITE LOCATION

N

SOURCE: BECKER AND KELLER, 1976

SUBSURFACE

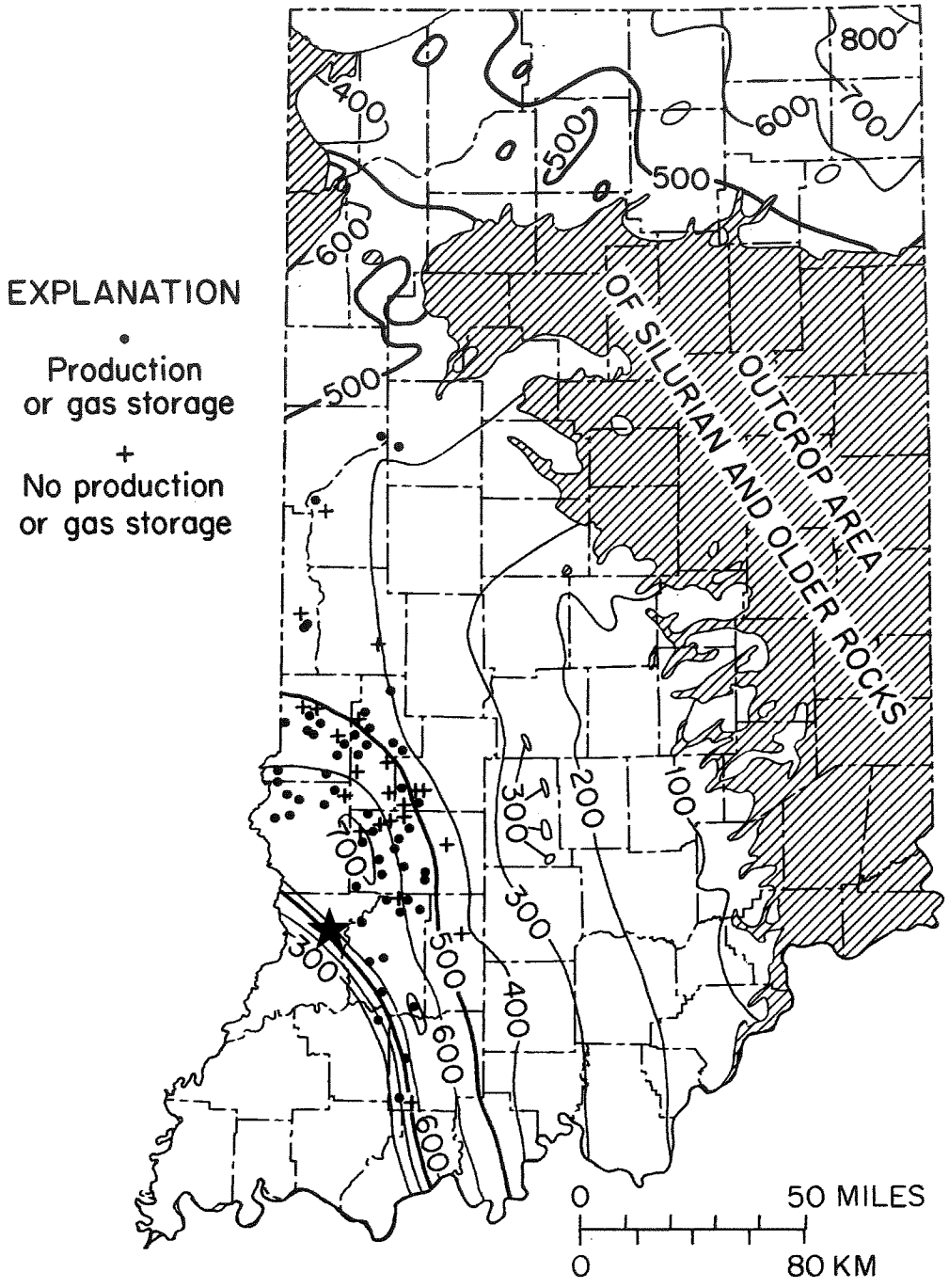
HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

FIGURE F.2.4–1

DUKE ENERGY
EDWARDSPORT FACILITY

ISOPACH MAP OF THE SILURIAN SYSTEM AND LOCATION OF REEFS IN SOUTHWESTERN INDIANA

DATE: 3/13/08	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:



LEGEND

★ SITE LOCATION

N

SOURCE: BECKER AND KELLER, 1976

SUBSURFACE

HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

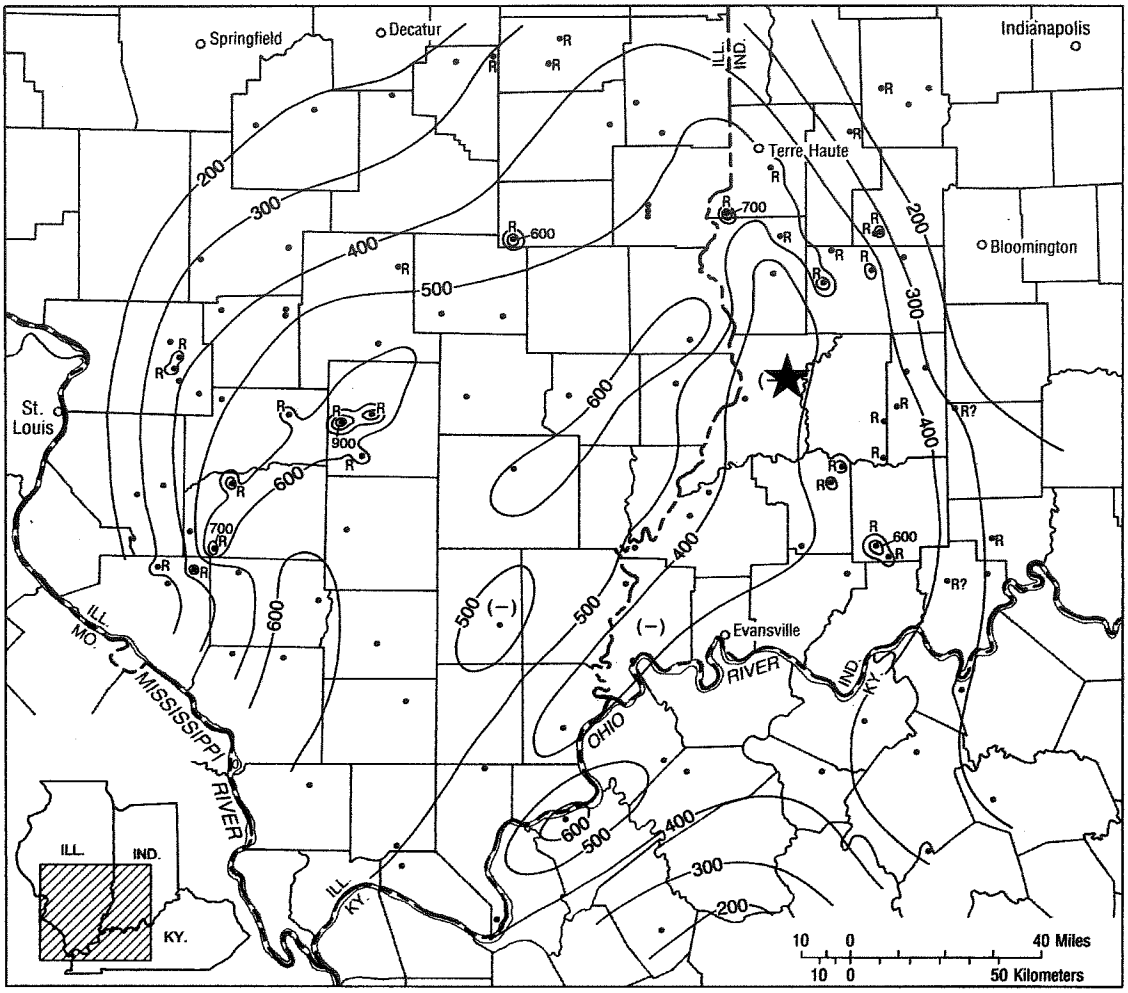
FIGURE F.2.4–1

DUKE ENERGY

EDWARDSPORT FACILITY

ISOPACH MAP OF THE SILURIAN SYSTEM AND LOCATION OF REEFS IN SOUTHWESTERN INDIANA

DATE: 12/11/06	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:



LEGEND

★ SITE LOCATION

R INDICATES WELLS THAT PENETRATE REEFS AND THAT MAY YIELD THICKNESSES GREATER THAN REGIONAL THICKNESSES. CONTOUR INTERVAL IS 100 FEET.

N

SOURCE: DROSTE AND SHAVER, 1987

SUBSURFACE

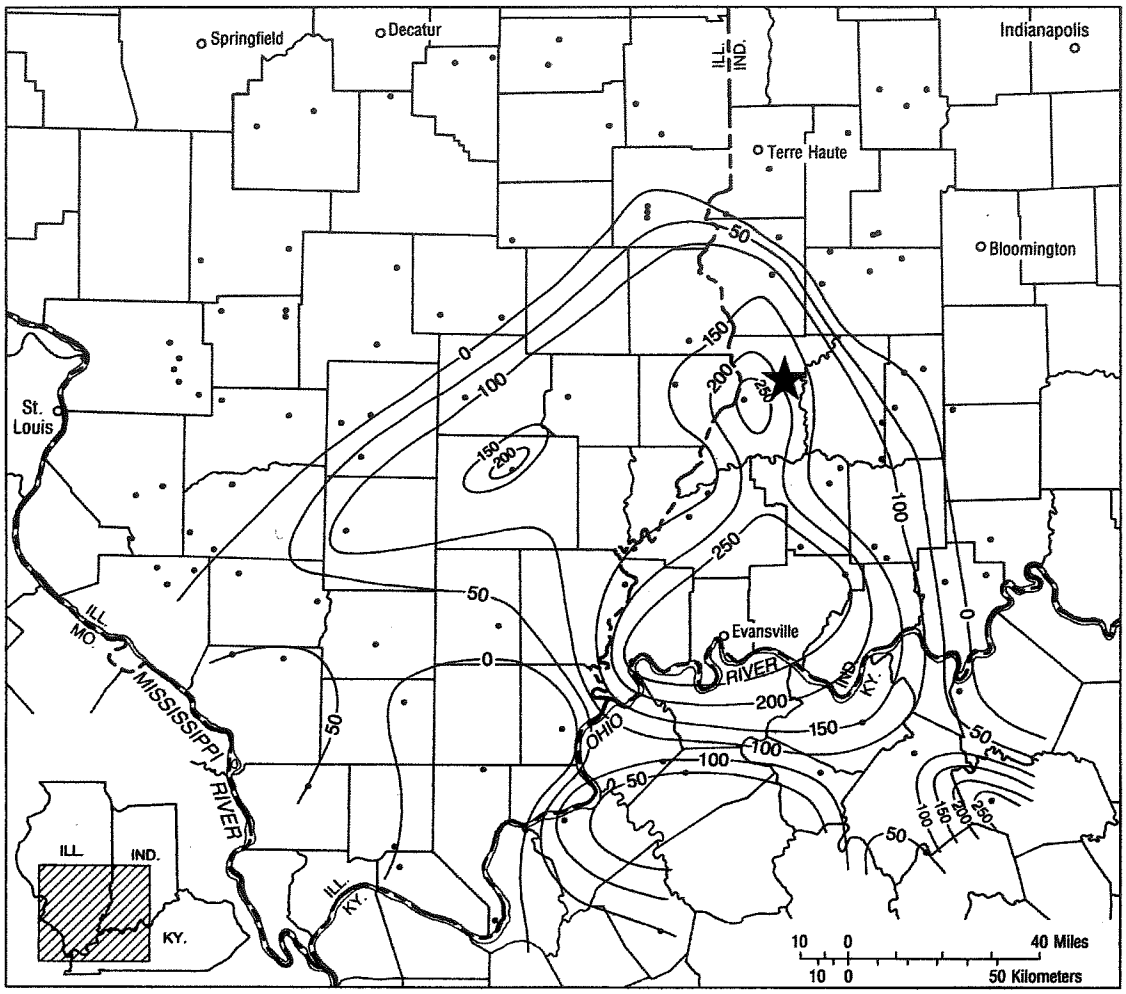
HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

FIGURE F.2.4–2

DUKE ENERGY
EDWARDSPORT FACILITY

MAP SHOWING THICKNESS OF THE MOCCASIN SPRINGS AND BAILEY LIMESTONE

DATE: 12/11/06	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:



LEGEND

★ SITE LOCATION

CONTOUR INTERVAL IS 50 FEET

N

SOURCE: DROSTE AND SHAVER, 1987

SUBSURFACE	HOUSTON, TX. SOUTH BEND, IN. BATON ROUGE, LA.

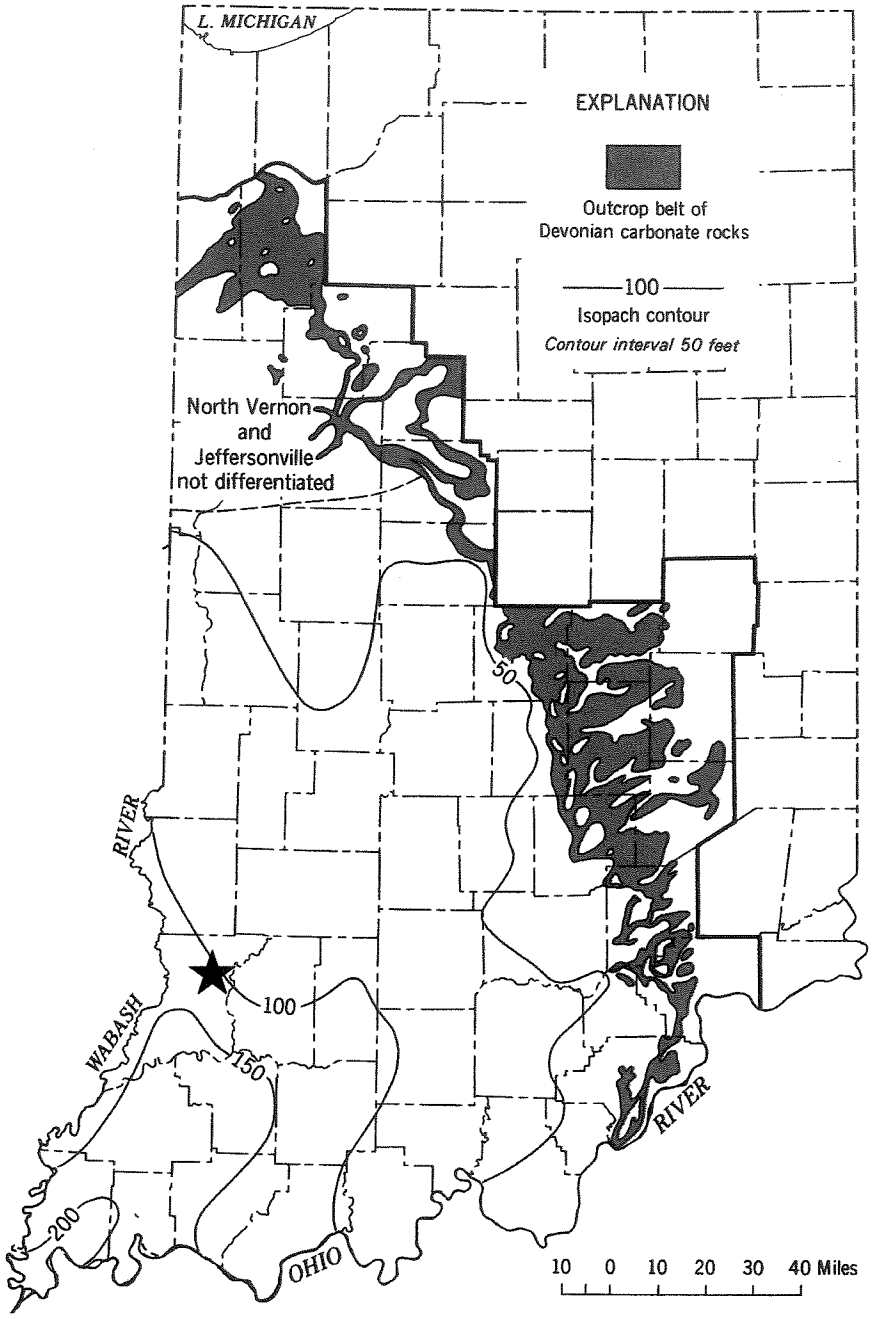
FIGURE F.2.5–1

DUKE ENERGY

EDWARDSPORT FACILITY

MAP SHOWING THICKNESS OF THE BACKBONE LIMESTONE IN THE ILLINOIS BASIN

DATE: 12/11/06	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:



LEGEND

★ SITE LOCATION

N

SOURCE: BECKER, 1974

SUBSURFACE

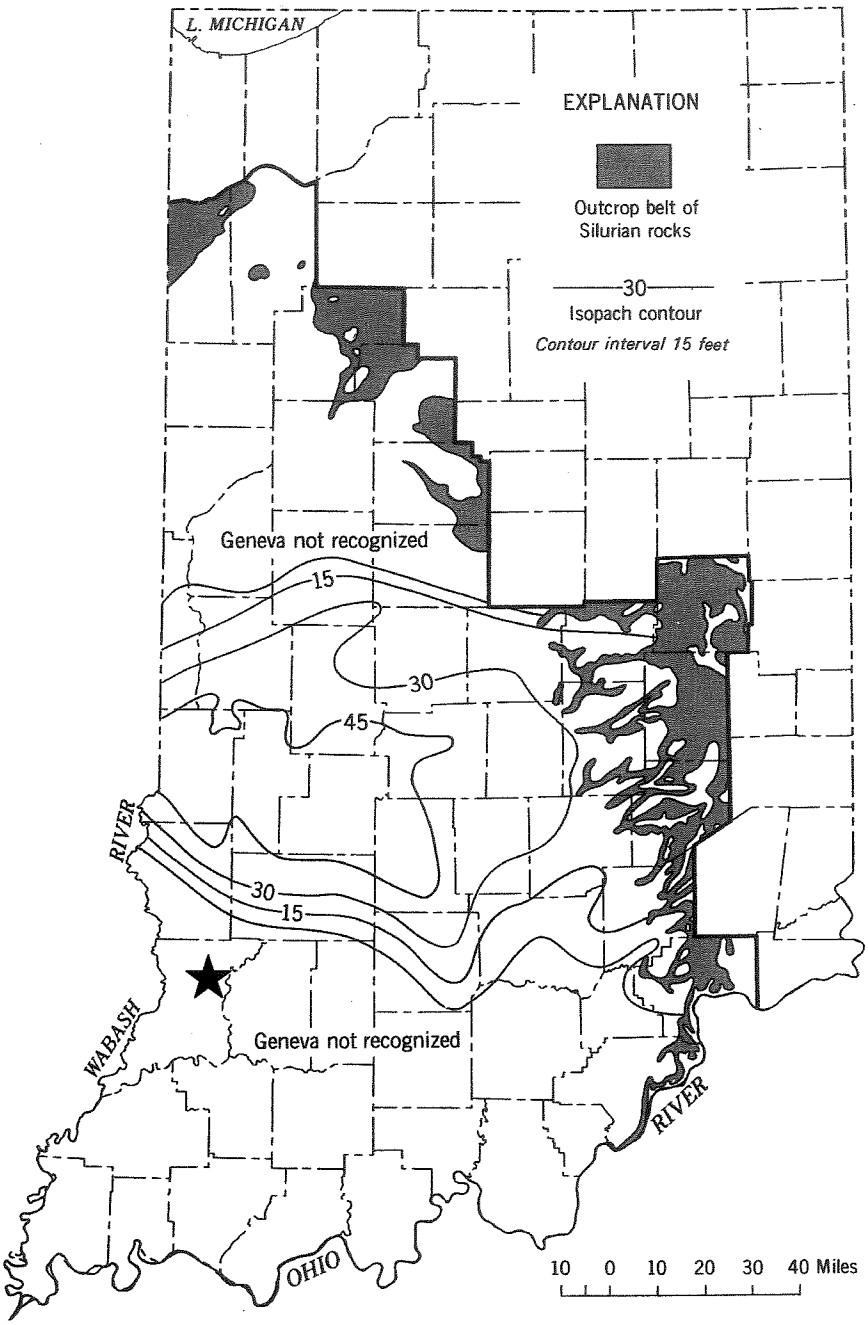
HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

FIGURE F.2.5–2

DUKE ENERGY
EDWARDSPORT FACILITY

MAP OF INDIANA SHOWING
THICKNESS OF THE JEFFERSONVILLE LIMESTONE

DATE: 12/11/06	CHECKED BY: RWS	JOB NO: 60Z5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:



LEGEND

★ SITE LOCATION

N

SOURCE: BECKER, 1974

SUBSURFACE

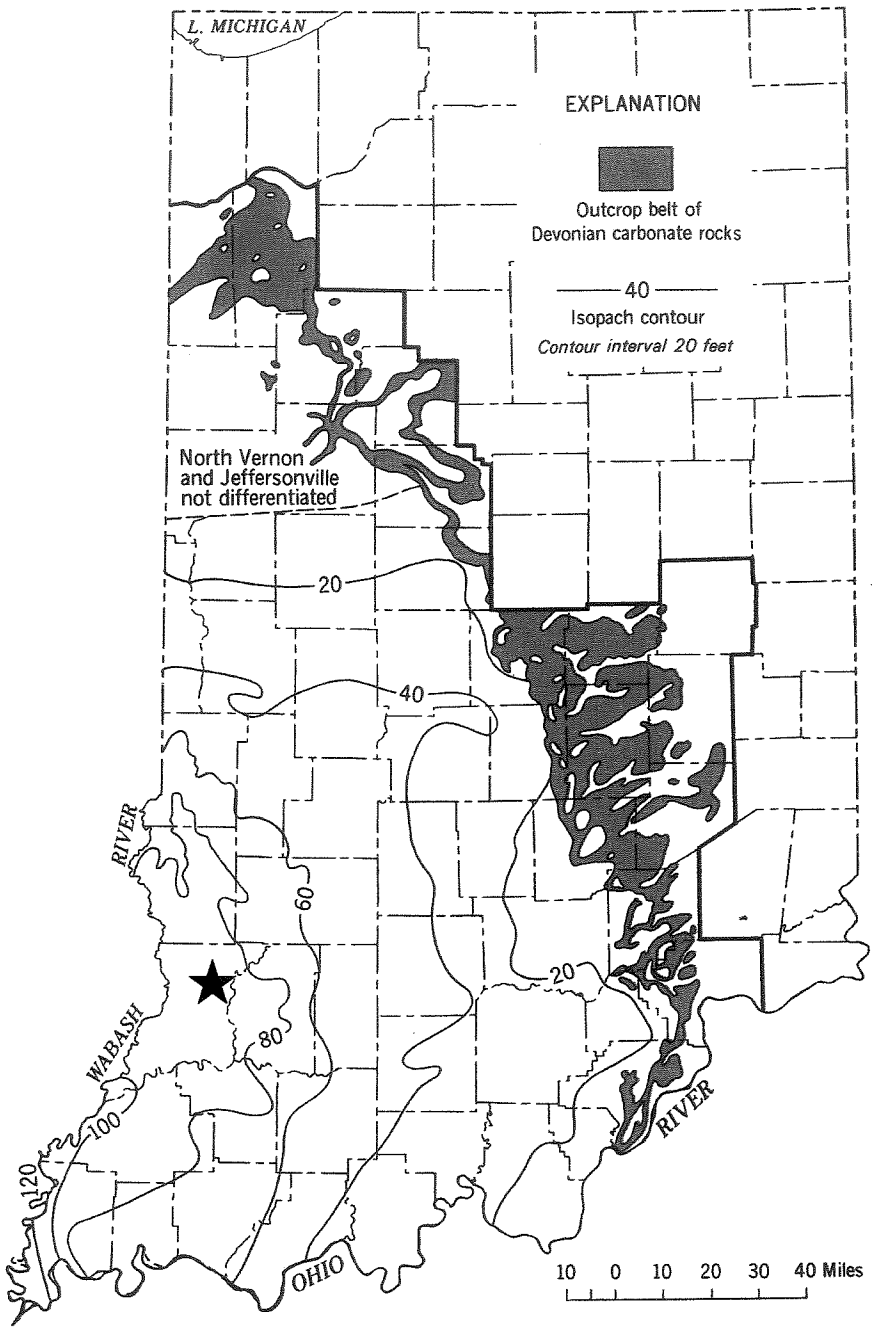
HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

FIGURE F.2.5–3

DUKE ENERGY
EDWARDSPORT FACILITY

MAP OF INDIANA SHOWING
THICKNESS OF THE GENEVA DOLOMITE

DATE: 12/11/06	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:



LEGEND

★ SITE LOCATION

N

SOURCE: BECKER, 1974

SUBSURFACE

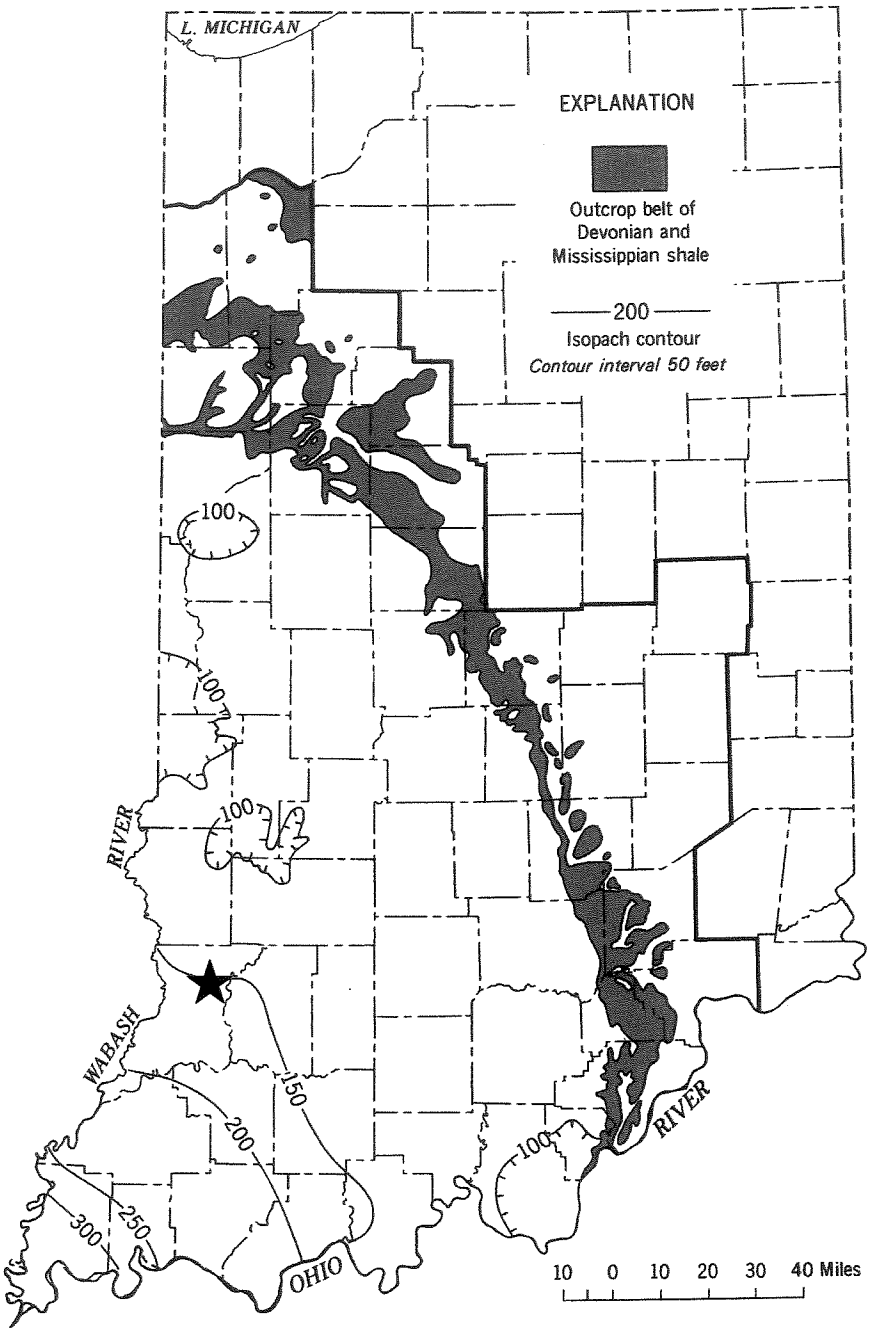
HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

FIGURE F.2.5–4

DUKE ENERGY
EDWARDSPORT FACILITY

MAP OF INDIANA SHOWING
THICKNESS OF THE NORTH VERNON LIMESTONE

DATE: 12/11/06	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:



LEGEND

★ SITE LOCATION

N

SOURCE: BECKER, 1974

SUBSURFACE

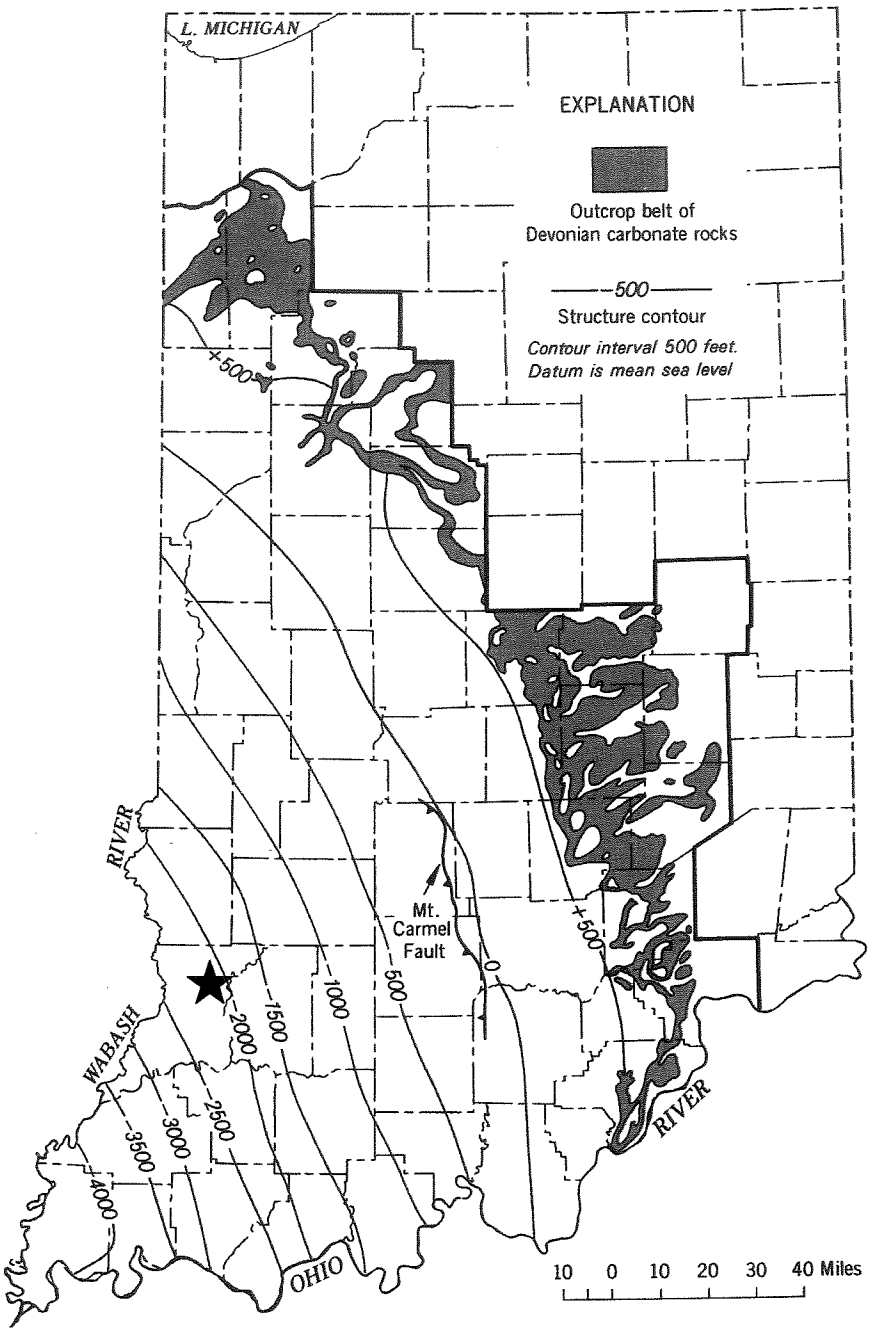
HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

FIGURE F.2.5–5

DUKE ENERGY
EDWARDSPORT FACILITY

MAP OF INDIANA SHOWING
THICKNESS OF THE NEW ALBANY SHALE

DATE: 12/11/06	CHECKED BY: RJS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:



LEGEND

★ SITE LOCATION

N

SOURCE: BECKER, 1974

SUBSURFACE

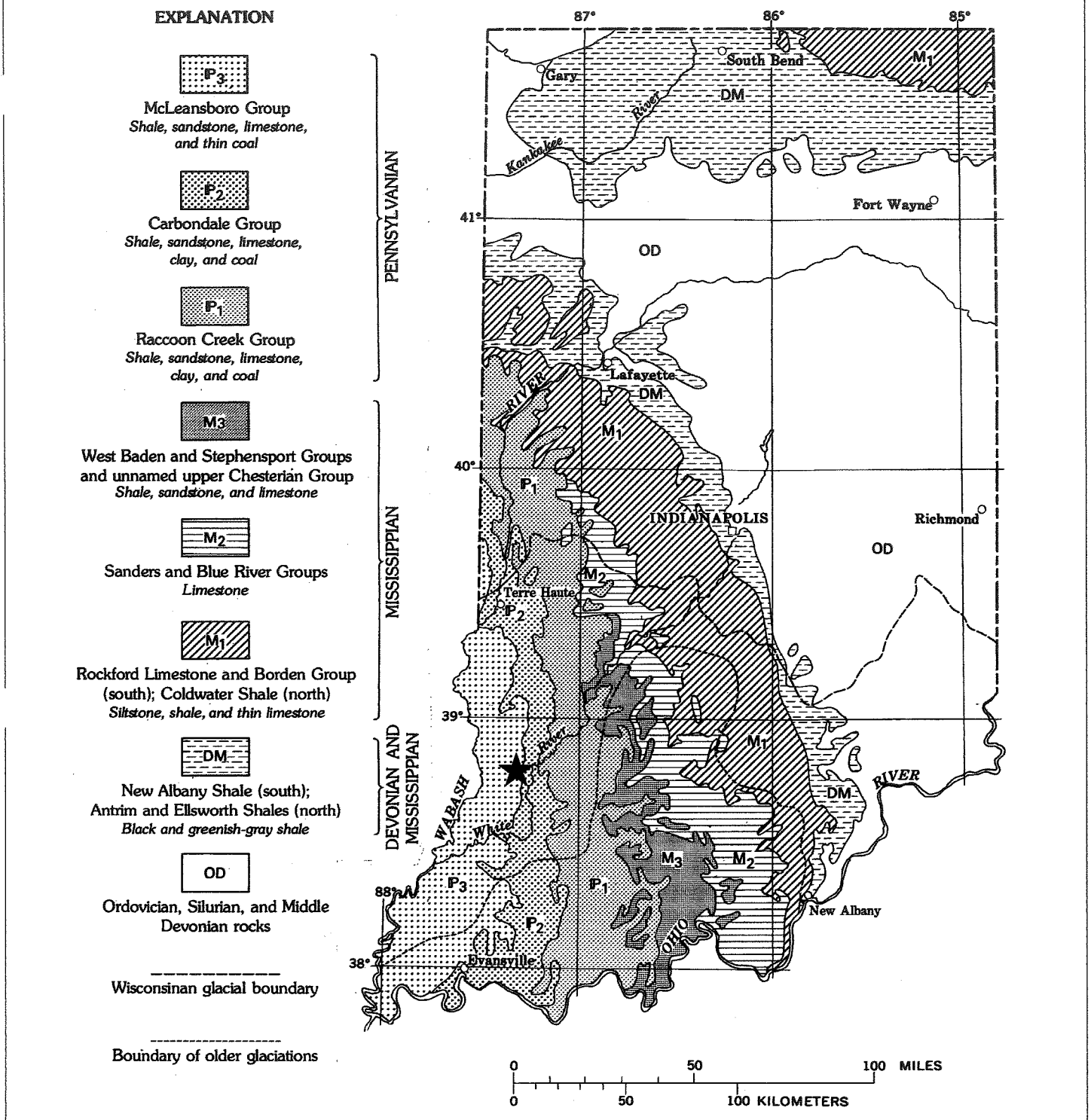
HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

FIGURE F.2.5–6

DUKE ENERGY
EDWARDSPORT FACILITY

MAP OF INDIANA SHOWING STRUCTURE ON BASE OF THE NEW ALBANY SHALE

DATE: 12/11/06	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:



SUBSURFACE

HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

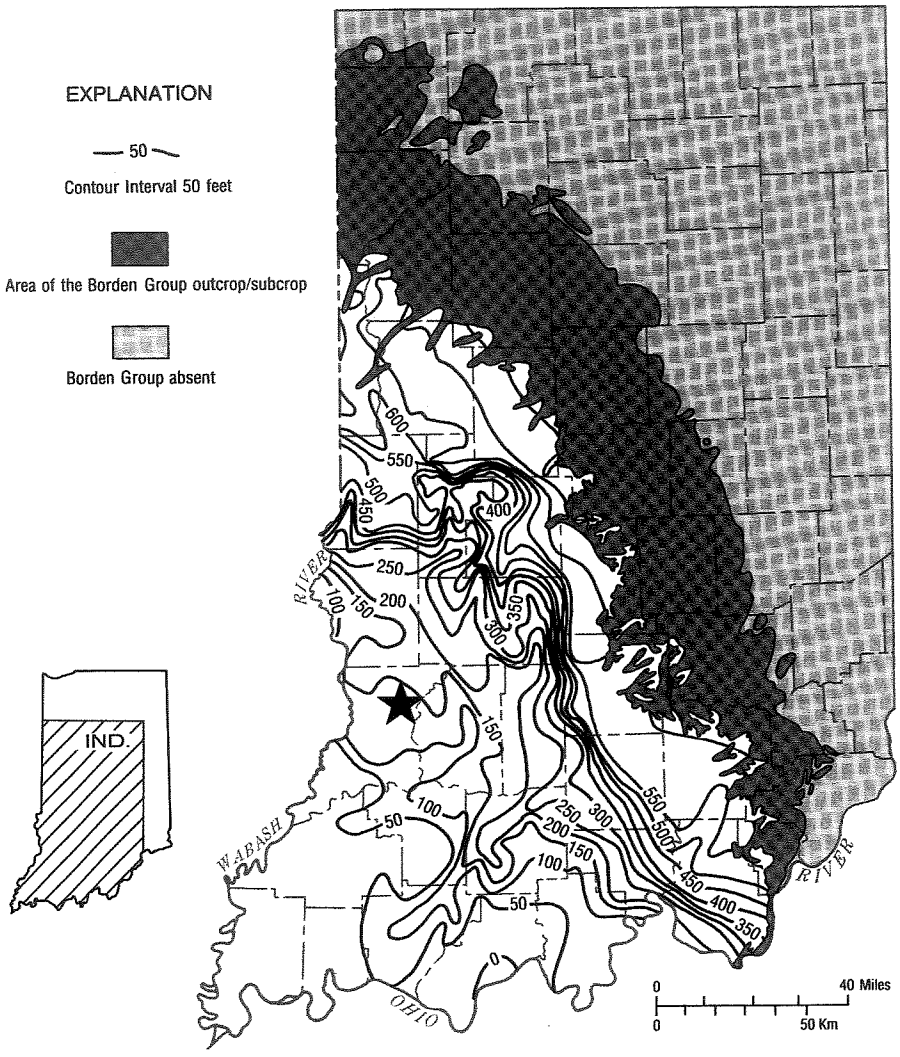
FIGURE F.2.6–1

DUKE ENERGY
EDWARDSPORT FACILITY

MAP OF INDIANA SHOWING THE DISTRIBUTION OF MISSISSIPPIAN AND PENNSYLVANIAN ROCKS

DATE: 12/11/06	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:

SOURCE: GRAY, 1979



LEGEND

★ SITE LOCATION

N

SOURCE: RUPP, 1991

SUBSURFACE

HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

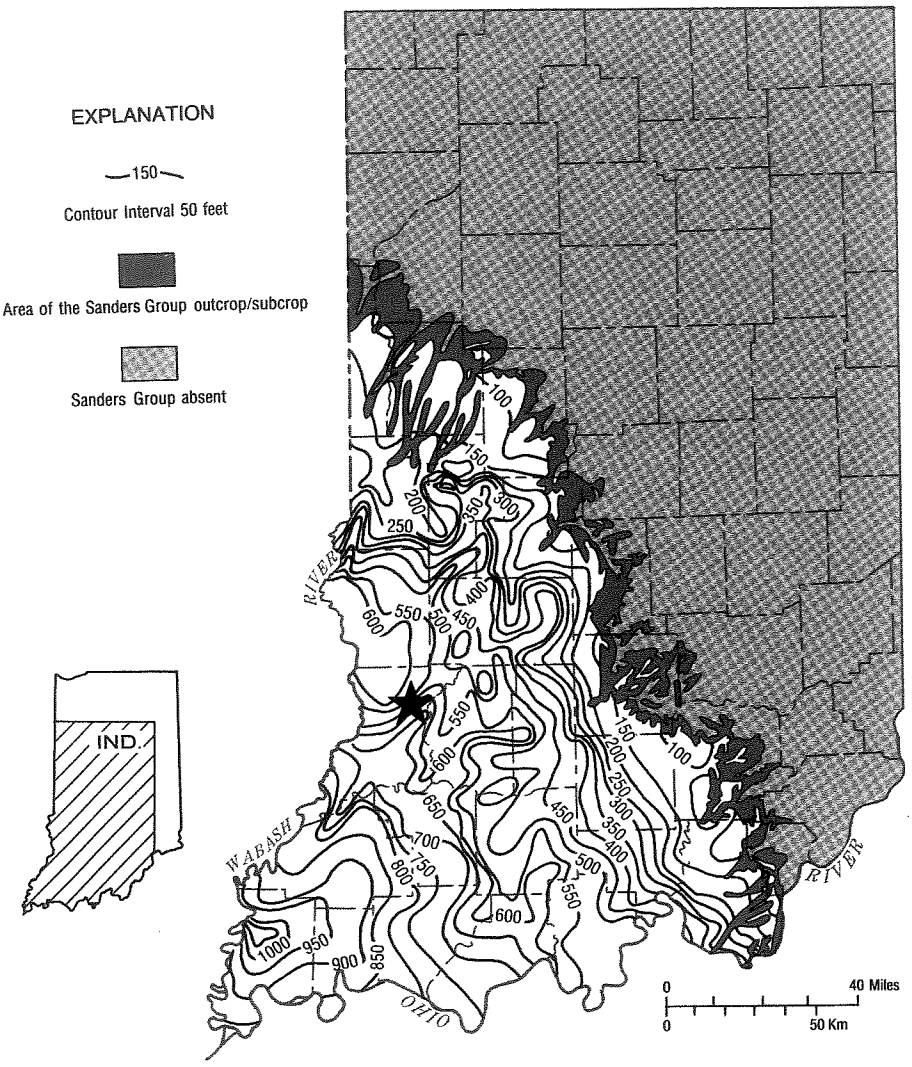
FIGURE F.2.6–2

DUKE ENERGY

EDWARDSPORT FACILITY

MAP OF INDIANA SHOWING
THICKNESS OF THE BORDEN GROUP

DATE: 12/11/06	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:



LEGEND

★ SITE LOCATION

N

SOURCE: RUPP, 1991

SUBSURFACE

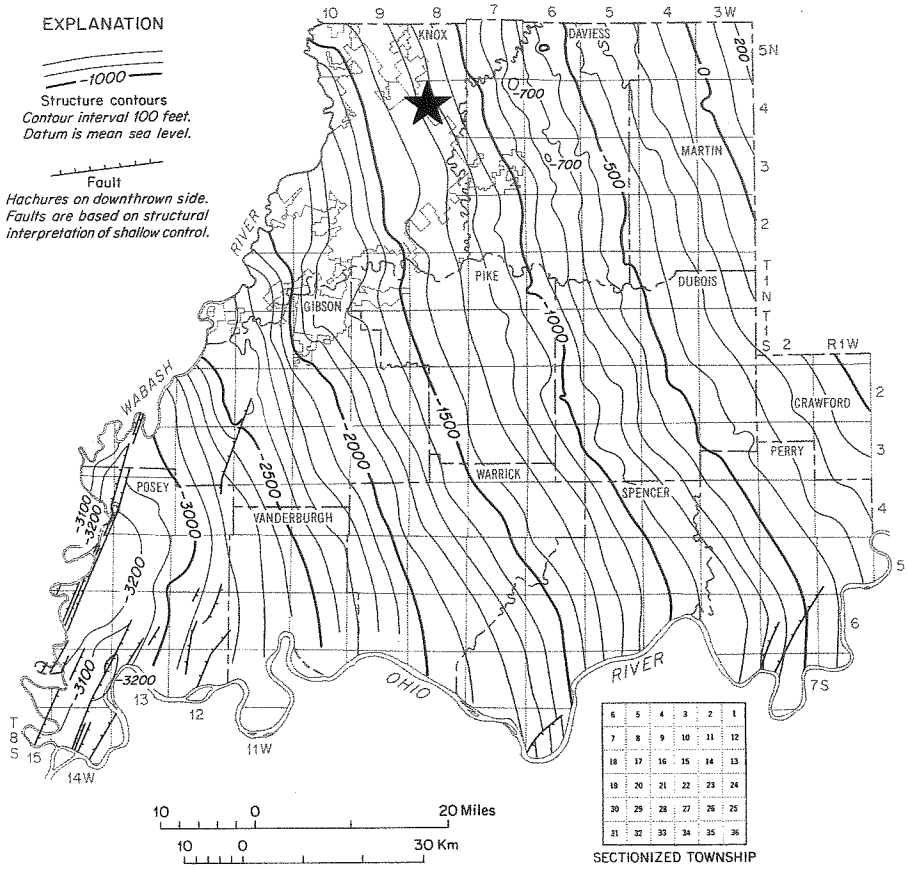
HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

FIGURE F.2.6–3

DUKE ENERGY
EDWARDSPORT FACILITY

MAP OF INDIANA SHOWING
THICKNESS OF THE SANDERS GROUP

DATE: 12/11/06	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:



LEGEND

★ SITE LOCATION

N

SOURCE: KELLER AND BECKER, 1980

SUBSURFACE

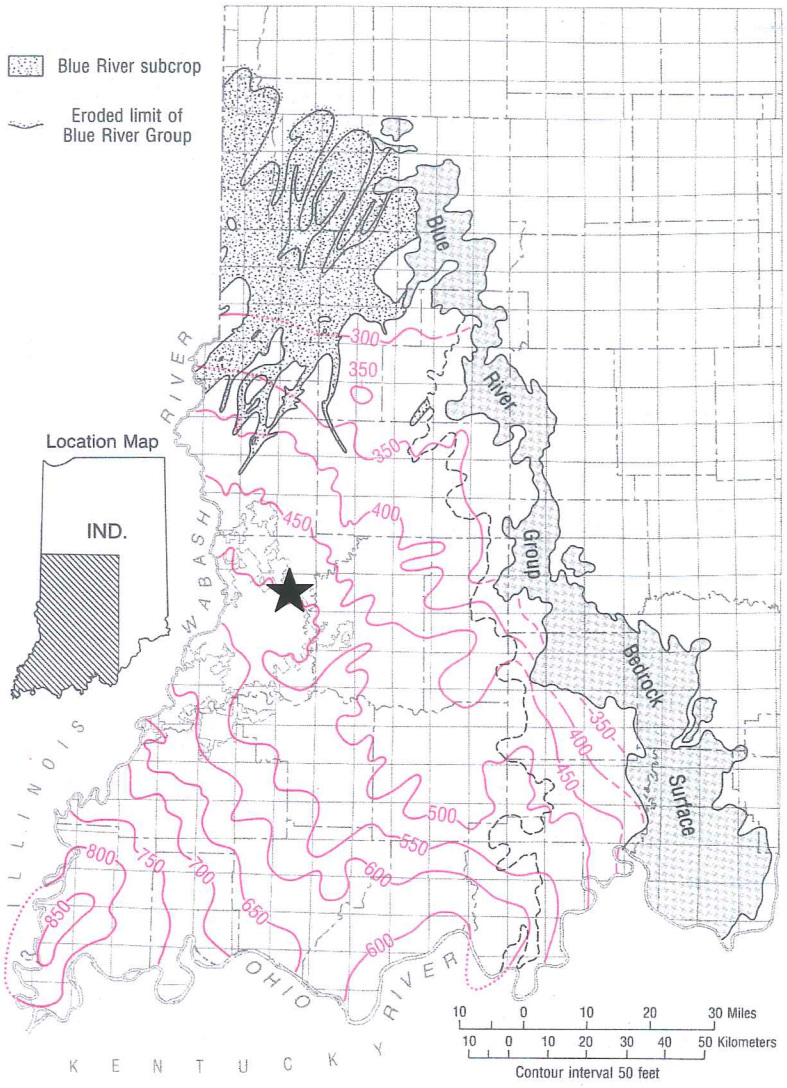
HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

FIGURE F.2.6-4

DUKE ENERGY
EDWARDSPORT FACILITY

MAP OF INDIANA SHOWING STRUCTURE ON TOP OF THE SALEM LIMESTONE

DATE: 12/11/06	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:



LEGEND

★ SITE LOCATION

N

SOURCE: DROSTE AND CARPENTER, 1990

SUBSURFACE

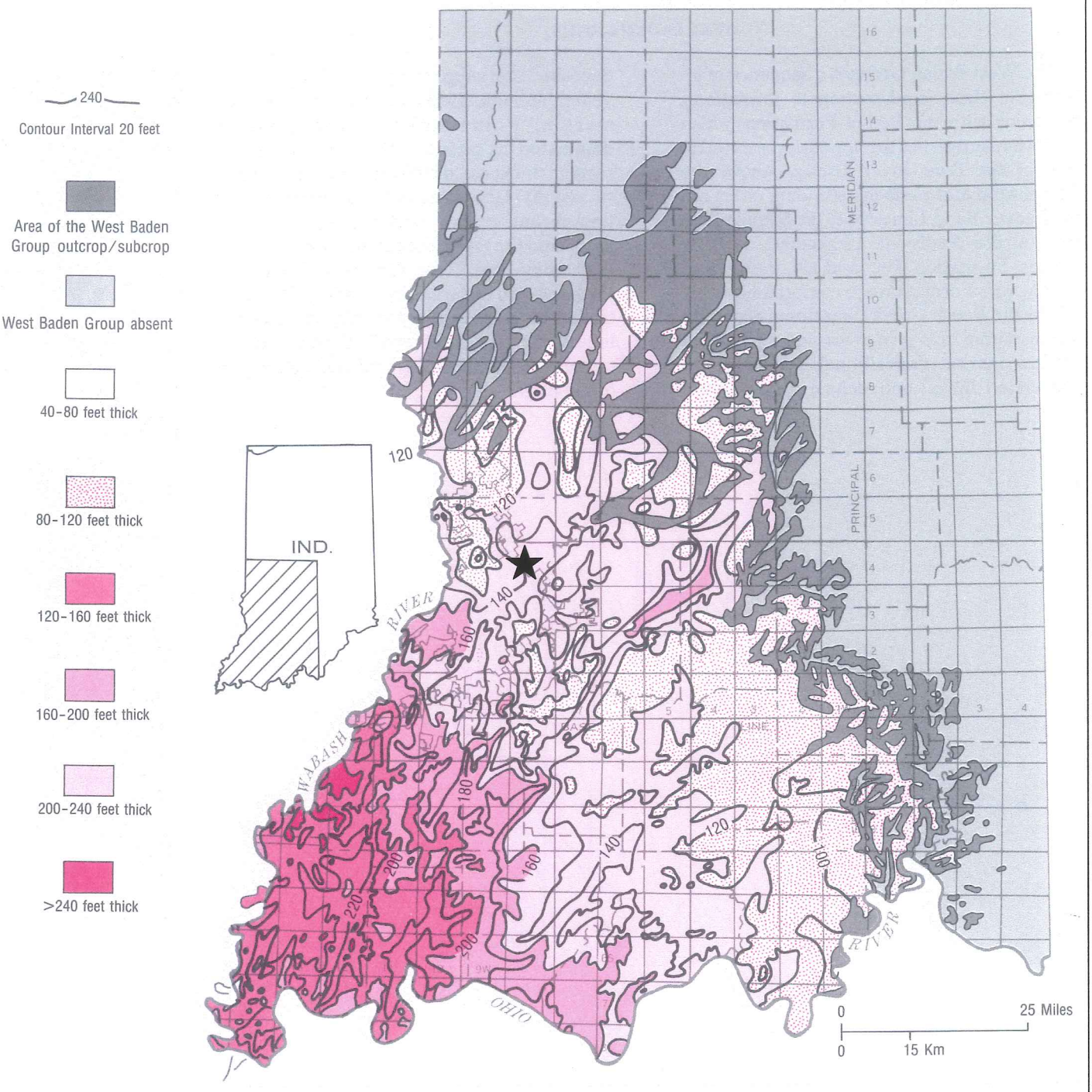
HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

FIGURE F.2.6–5

DUKE ENERGY
EDWARDSPORT FACILITY

MAP OF INDIANA SHOWING
THICKNESS OF THE BLUE RIVER GROUP

DATE: 12/11/06	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:



LEGEND

★ SITE LOCATION

N

SOURCE: RUPP, 1991

SUBSURFACE

HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

FIGURE F.2.6-6

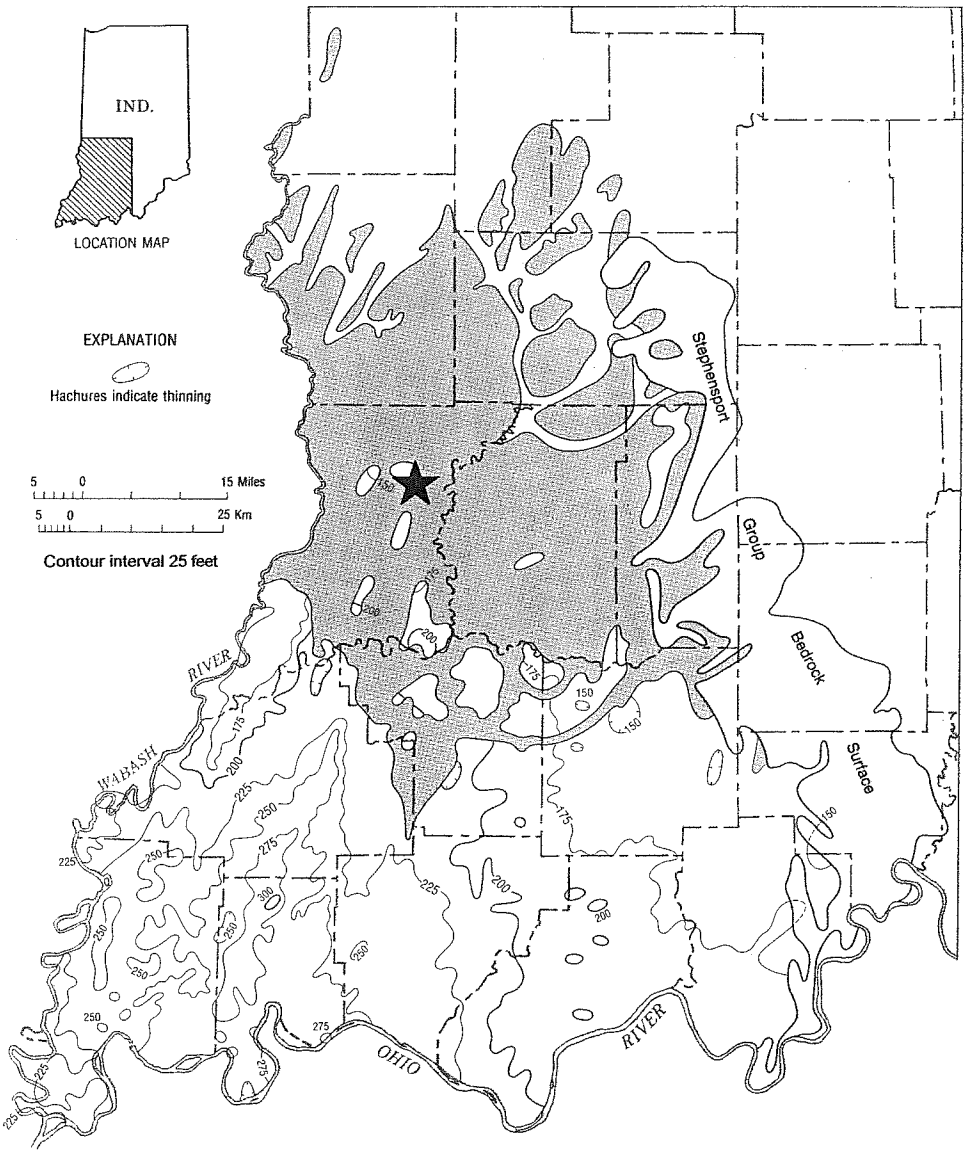
DUKE ENERGY

EDWARDSPORT FACILITY

MAP OF INDIANA SHOWING
THICKNESS OF THE WEST BADEN GROUP

DATE: 12/11/06	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:

APR 2008



LEGEND

★ SITE LOCATION

SUBCROP OF STEPHENSPORT GROUP BENEATH PENNSYLVANIAN IS SHADED.

N

SOURCE: DROSTE AND KELLER, 1995

SUBSURFACE

HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

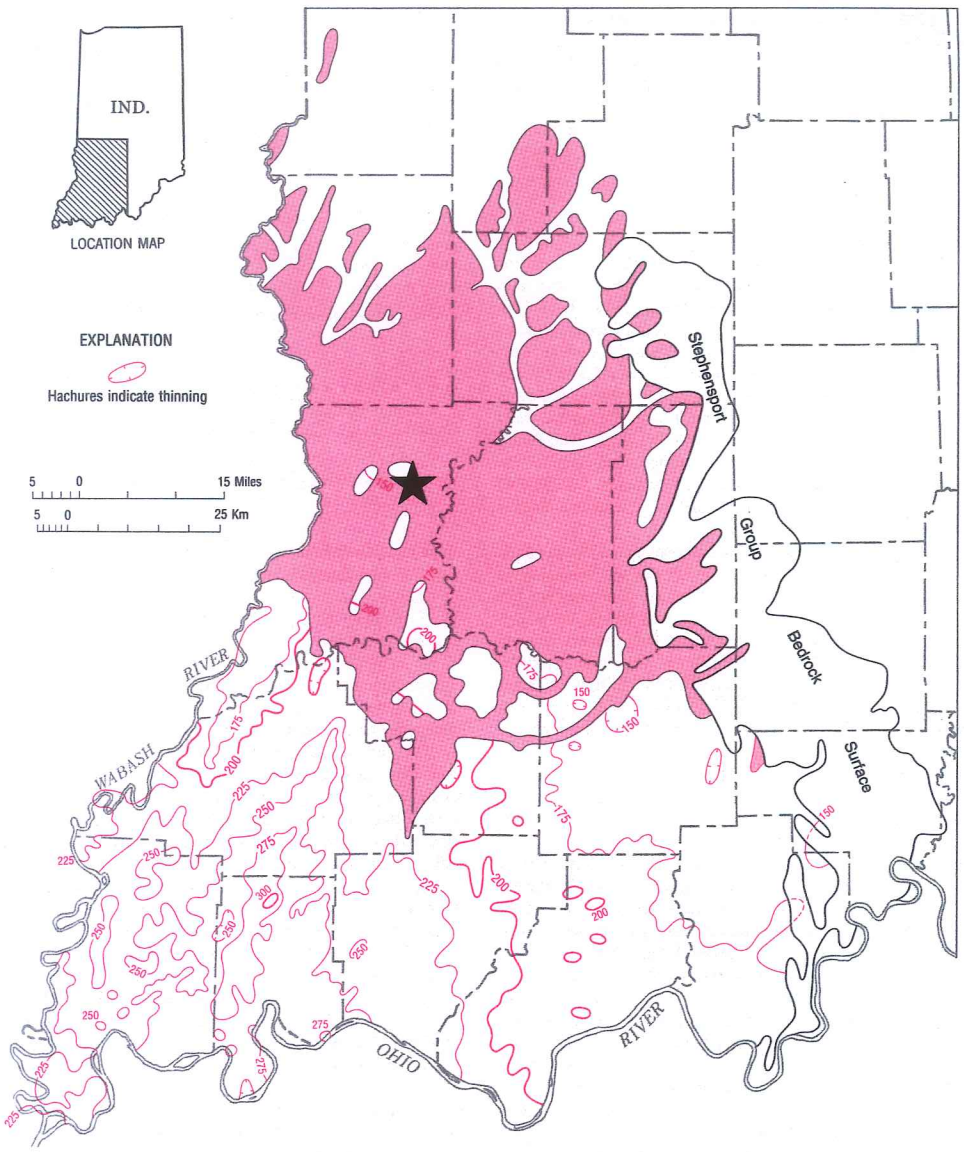
FIGURE F.2.6-7

DUKE ENERGY
EDWARDSPORT FACILITY

MAP OF INDIANA SHOWING THICKNESS OF THE STEPHENSPORT GROUP

DATE: 3/13/08	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:

MAR — 2007



LEGEND

★ SITE LOCATION

N

SOURCE: DROSTE AND KELLER, 1995

SUBSURFACE

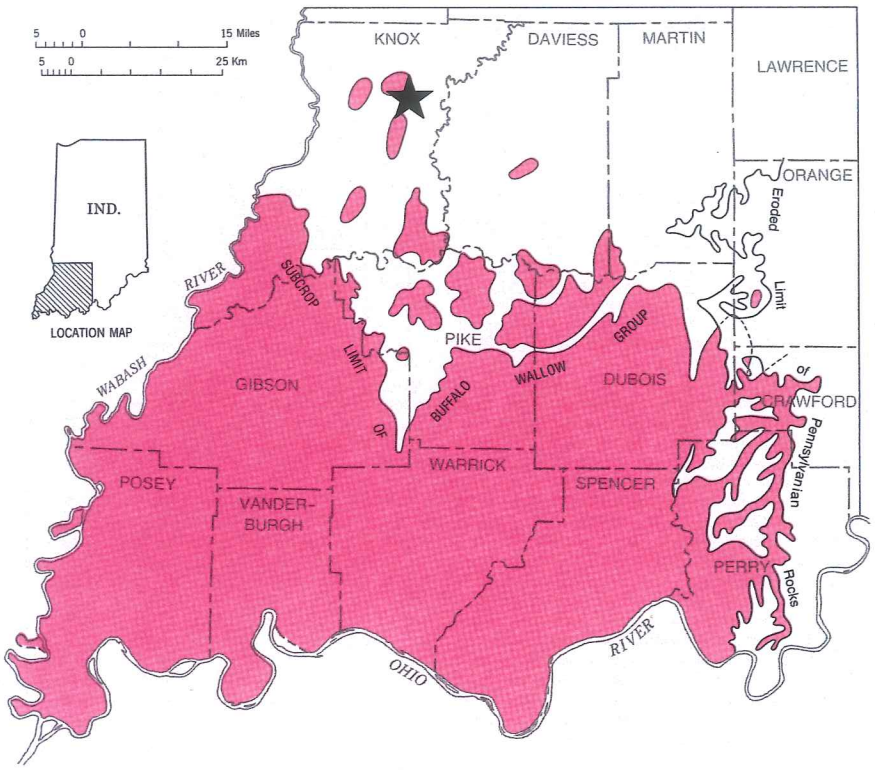
HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

FIGURE F.2.6–7

DUKE ENERGY
EDWARDSPORT FACILITY

MAP OF INDIANA SHOWING
THICKNESS OF THE STEPHENSPORT GROUP

DATE: 12/11/06	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:



LEGEND

★ SITE LOCATION

N

SOURCE: DROSTE AND KELLER, 1995

SUBSURFACE

HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

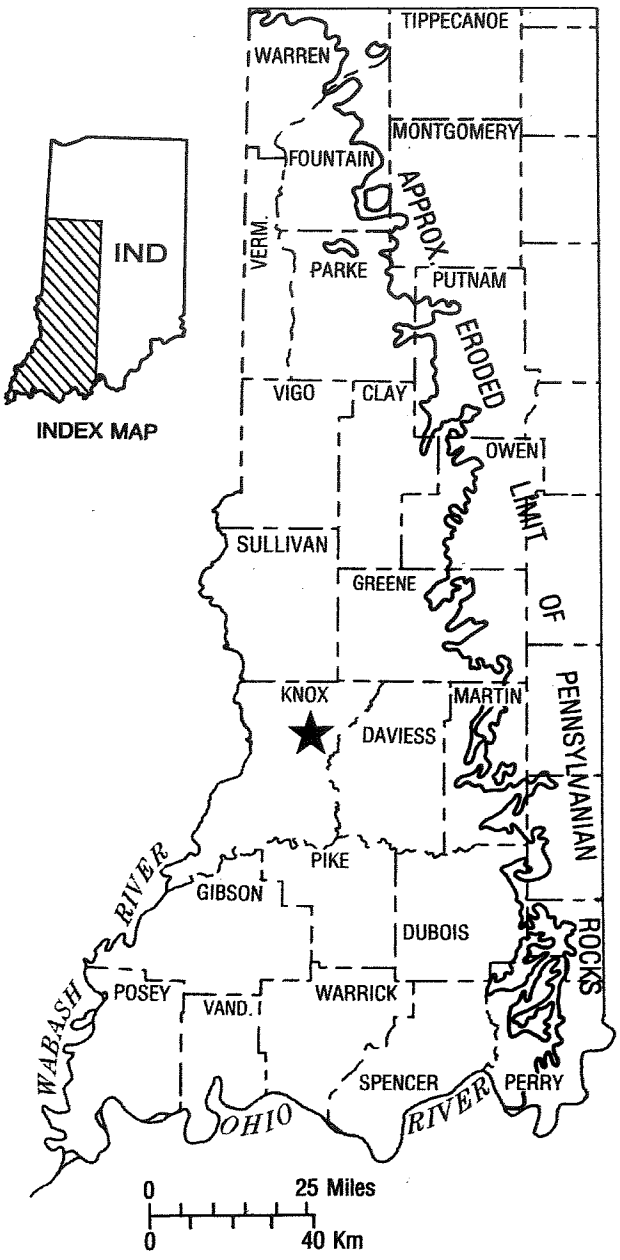
FIGURE F.2.6–8

DUKE ENERGY

EDWARDSPORT FACILITY

MAP SHOWING THE ERODED LIMIT OF THE PENNSYLVANIAN SYSTEM AND THE SUBCROP LIMIT OF THE BUFFALO WALLOW GROUP

DATE: 12/11/06	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:



LEGEND

★ SITE LOCATION

N

SOURCE: DROSTE AND KELLER, 1989

SUBSURFACE

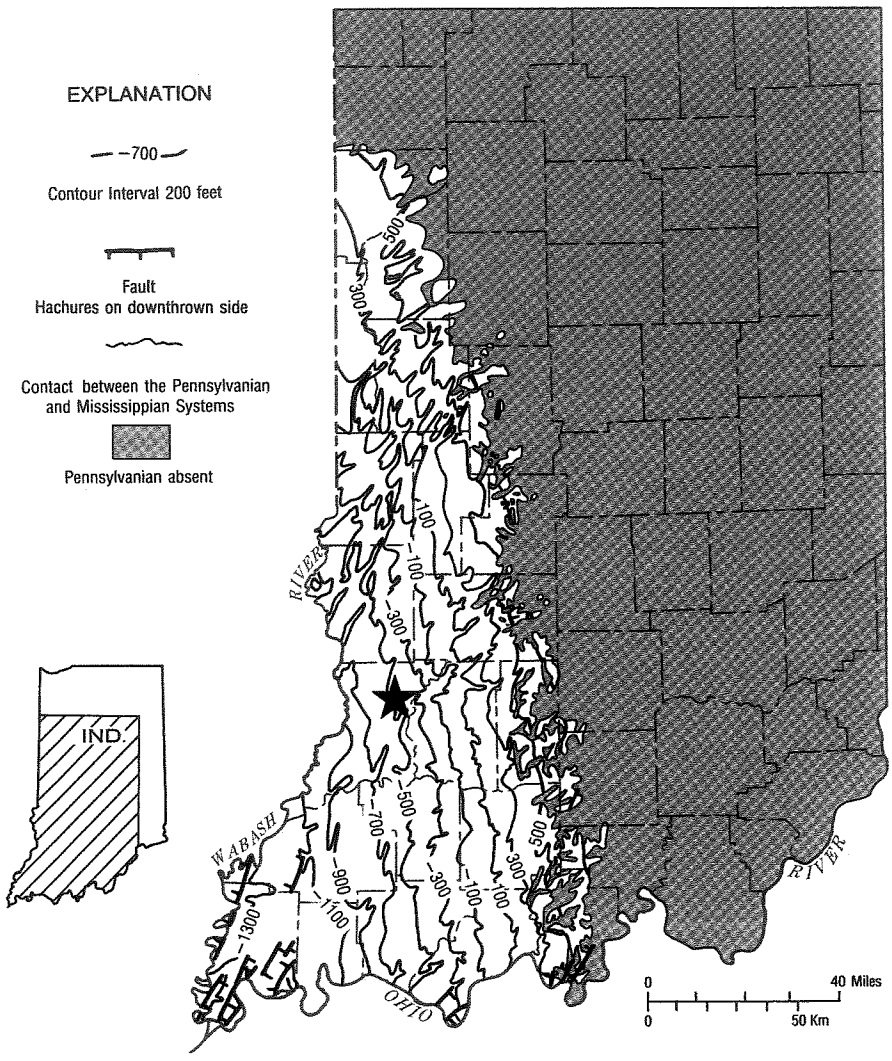
HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

FIGURE F.2.7–1

DUKE ENERGY
EDWARDSPORT FACILITY

MAP SHOWING APPROXIMATE ERODED LIMIT OF PENNSYLVANIAN ROCKS IN INDIANA

DATE: 12/11/06	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:



LEGEND

★ SITE LOCATION

N

SUBSURFACE

HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

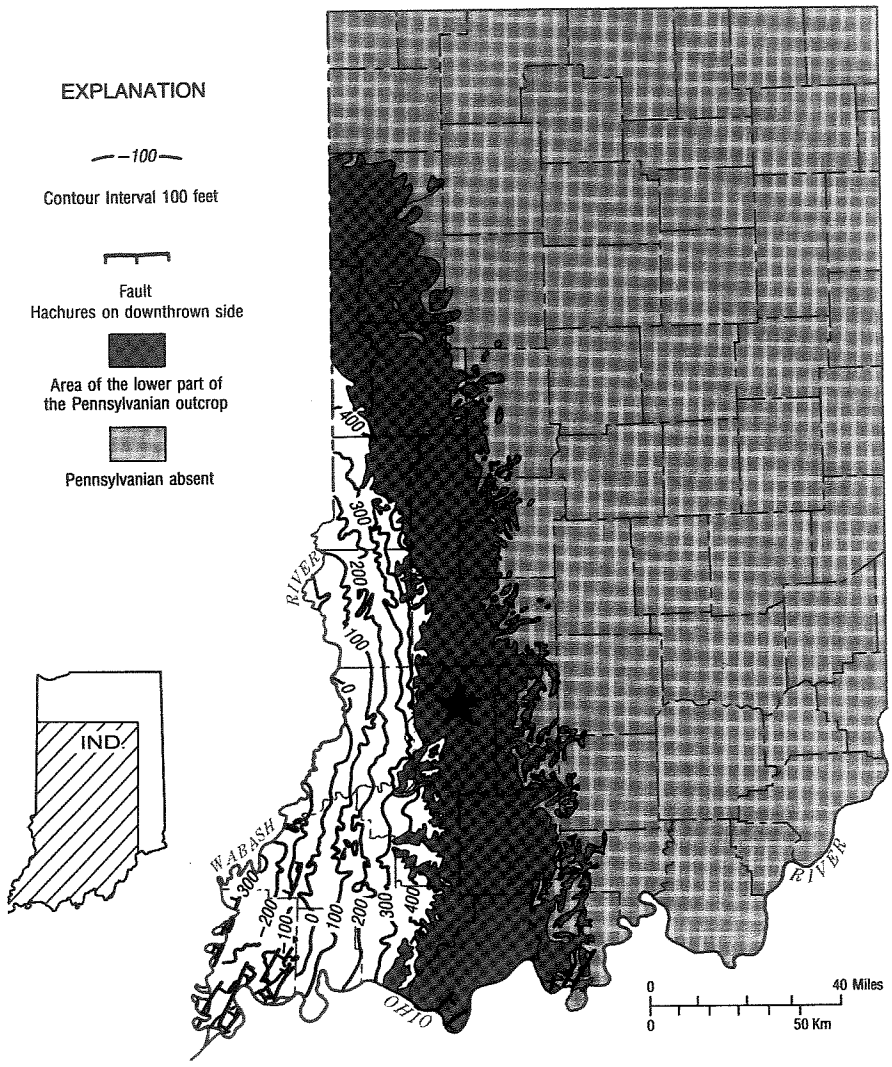
FIGURE F.2.7–2

DUKE ENERGY
EDWARDSPORT FACILITY

MAP SHOWING STRUCTURE ON THE BASE OF THE PENNSYLVANIAN SYSTEM

DATE: 12/11/06	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:

SOURCE: RUPP, 1991



LEGEND

★ SITE LOCATION

N

SUBSURFACE

HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

FIGURE F.2.7–3

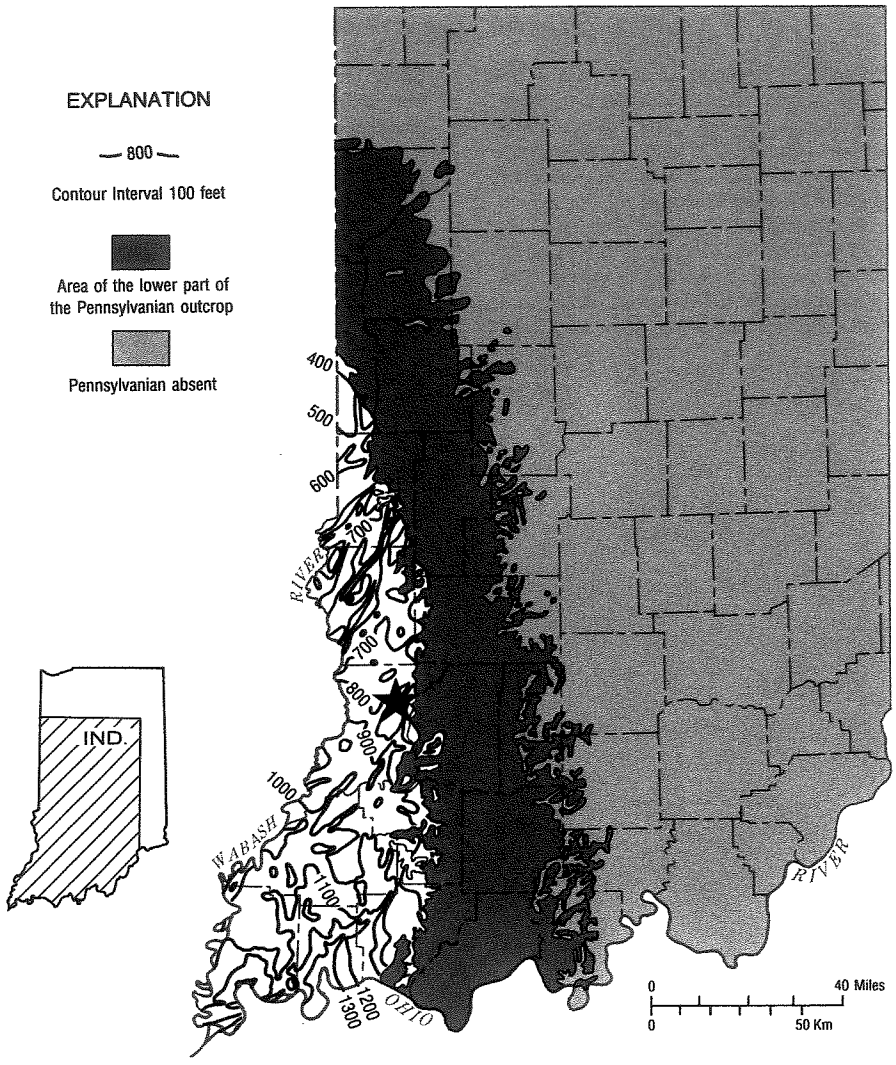
DUKE ENERGY

EDWARDSPORT FACILITY

MAP SHOWING STRUCTURE ON TOP OF THE SPRINGFIELD COAL MEMBER OF THE PETERSBURG FORMATION IN INDIANA

DATE: 12/11/06	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:

SOURCE: RUPP, 1991



LEGEND

★ SITE LOCATION

N

SUBSURFACE

HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

FIGURE F.2.7–4

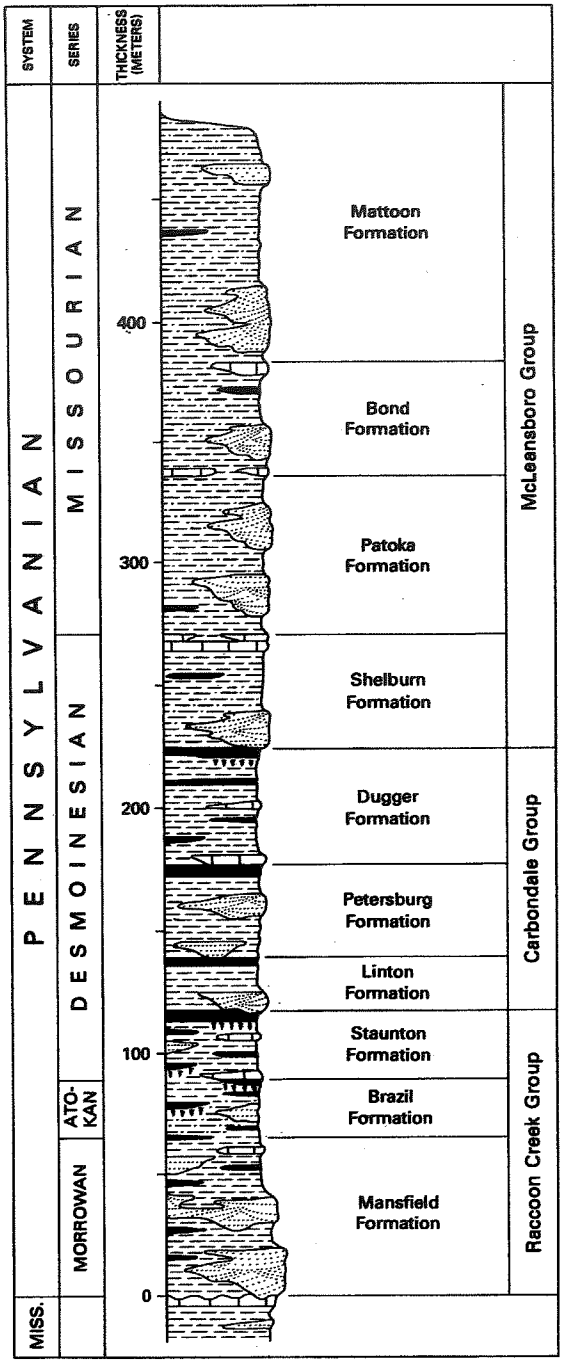
DUKE ENERGY

EDWARDSPORT FACILITY

MAP SHOWING THE THICKNESS OF THE LOWER PART OF THE PENNSYLVANIAN SYSTEM IN INDIANA

DATE: 12/11/06	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:

SOURCE: RUPP, 1991



SOURCE: GRAY, 1979

SUBSURFACE

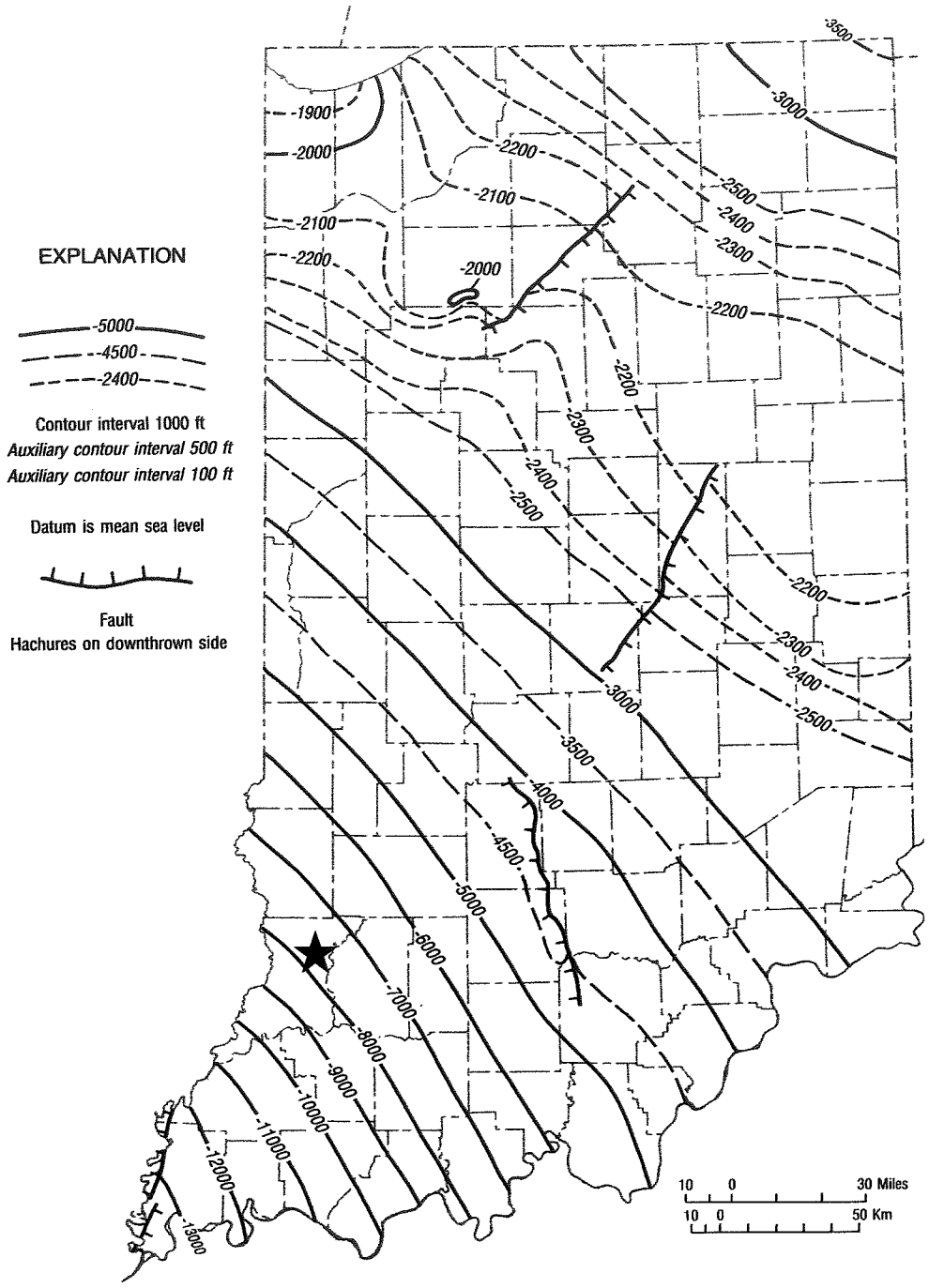
HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

FIGURE F.2.7–5

DUKE ENERGY
EDWARDSPORT FACILITY

COLUMNAR SECTION SHOWING
EXPOSED PENNSYLVANIAN ROCKS IN INDIANA

DATE: 12/11/06	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:



LEGEND

★ SITE LOCATION

N

SOURCE: RUPP, 1991

SUBSURFACE

HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

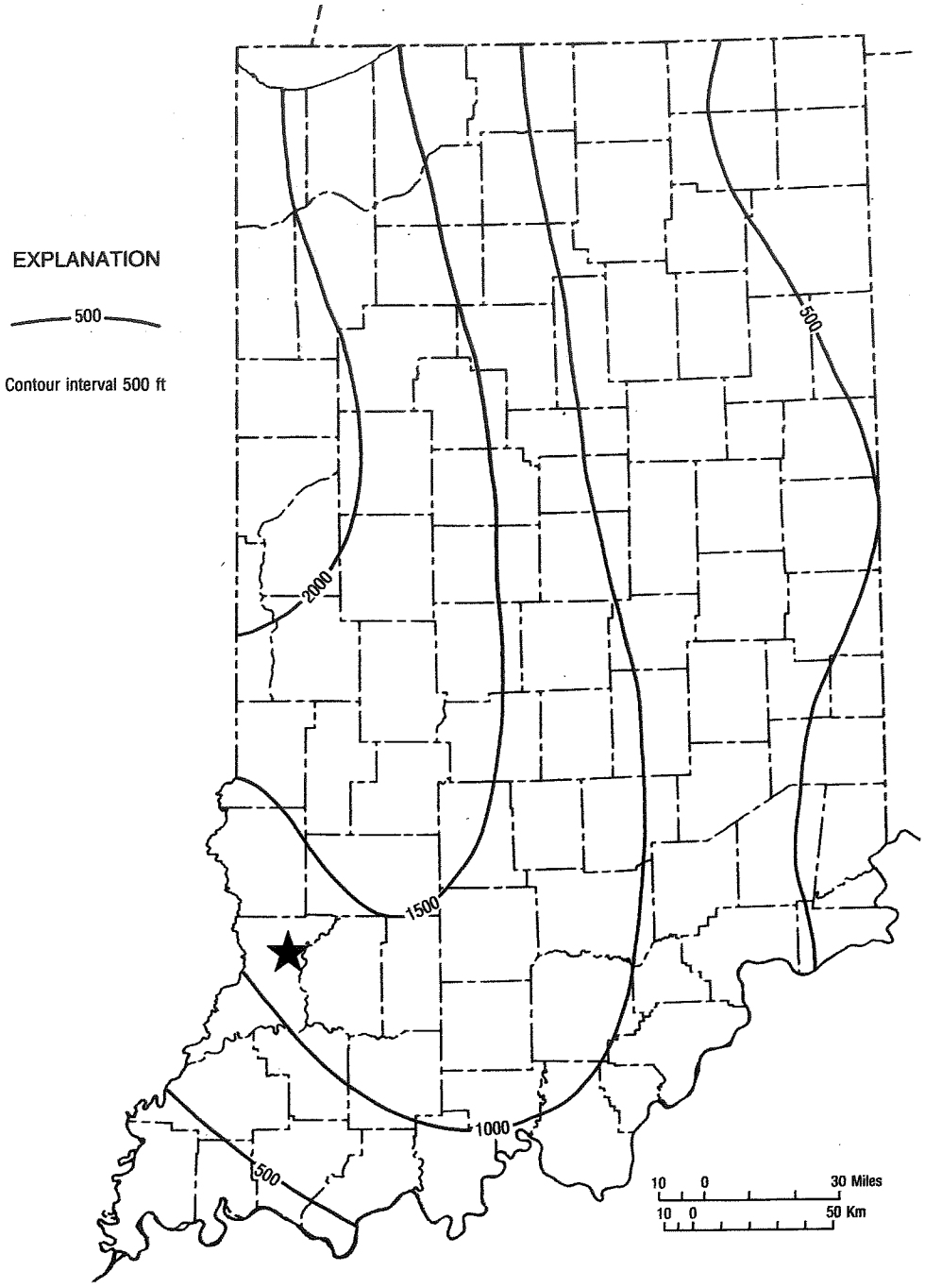
FIGURE F.3–1

DUKE ENERGY

EDWARDSPORT FACILITY

MAP OF INDIANA SHOWING STRUCTURE ON TOP OF THE MT. SIMON SANDSTONE

DATE: 12/11/06	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:



LEGEND

★ SITE LOCATION

N

SOURCE: RUPP, 1991

SUBSURFACE

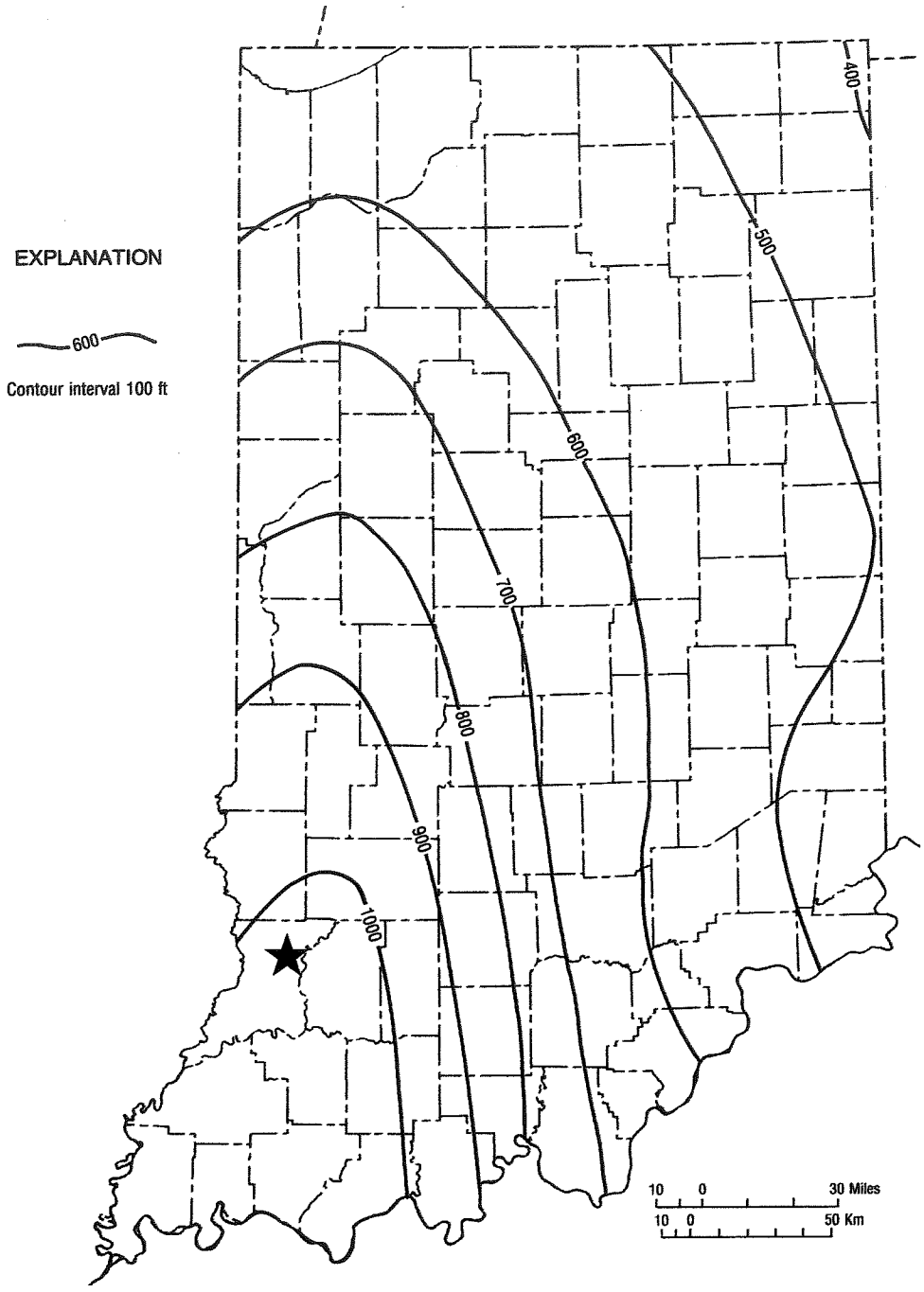
HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

FIGURE F.3-2

DUKE ENERGY
EDWARDSPORT FACILITY

MAP OF INDIANA SHOWING
THICKNESS OF THE MT. SIMON SANDSTONE

DATE: 12/11/06	CHECKED BY: RWS	JOB NO: 60Z5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:



LEGEND

★ SITE LOCATION

N

SOURCE: RUPP, 1991

SUBSURFACE

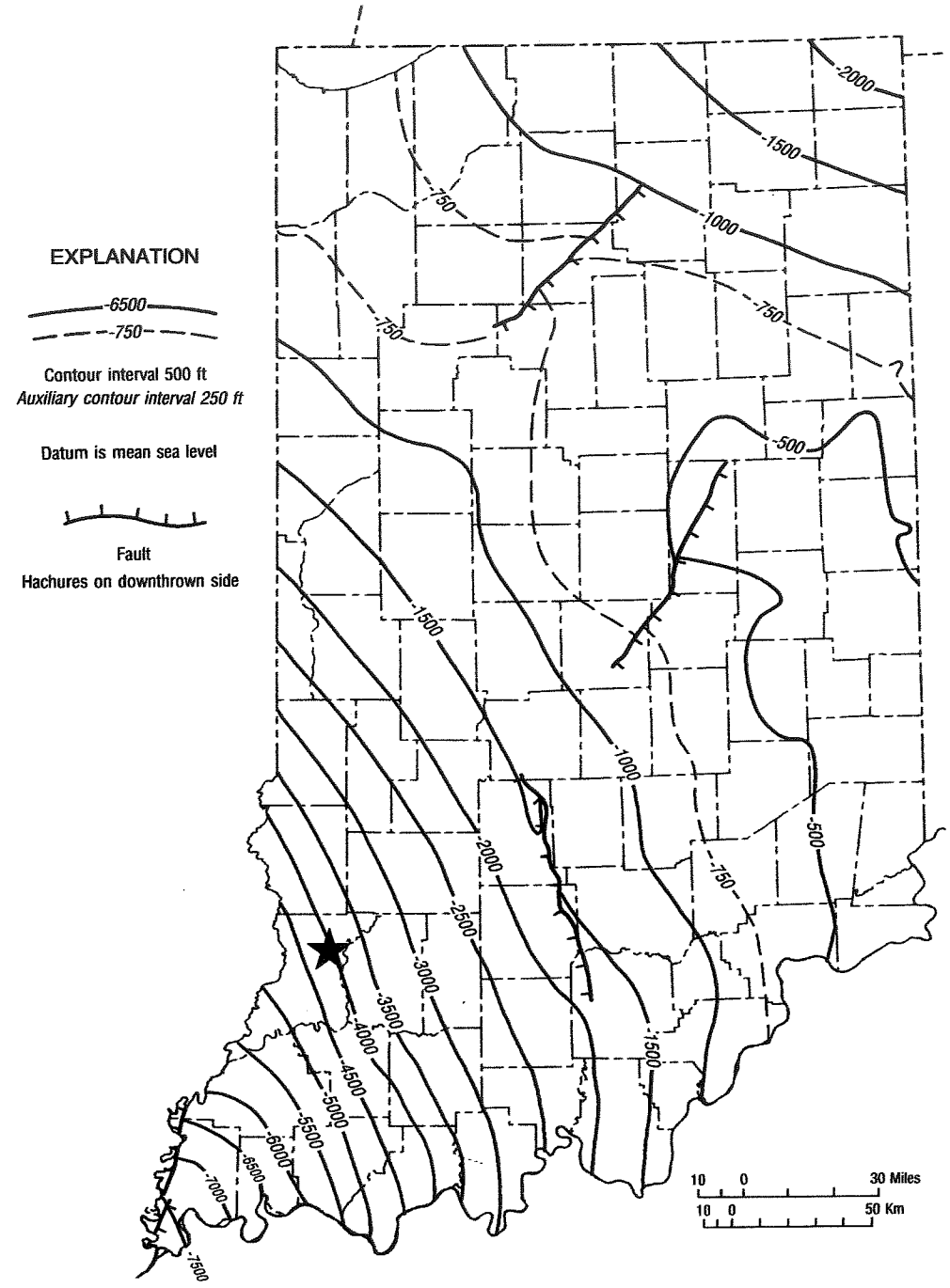
HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

FIGURE F.3-3

DUKE ENERGY
EDWARDSPORT FACILITY

MAP OF INDIANA SHOWING
THICKNESS OF THE EAU CLAIRE FORMATION

DATE: 12/11/06	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:



LEGEND

★ SITE LOCATION

N

SOURCE: RUPP, 1991

SUBSURFACE

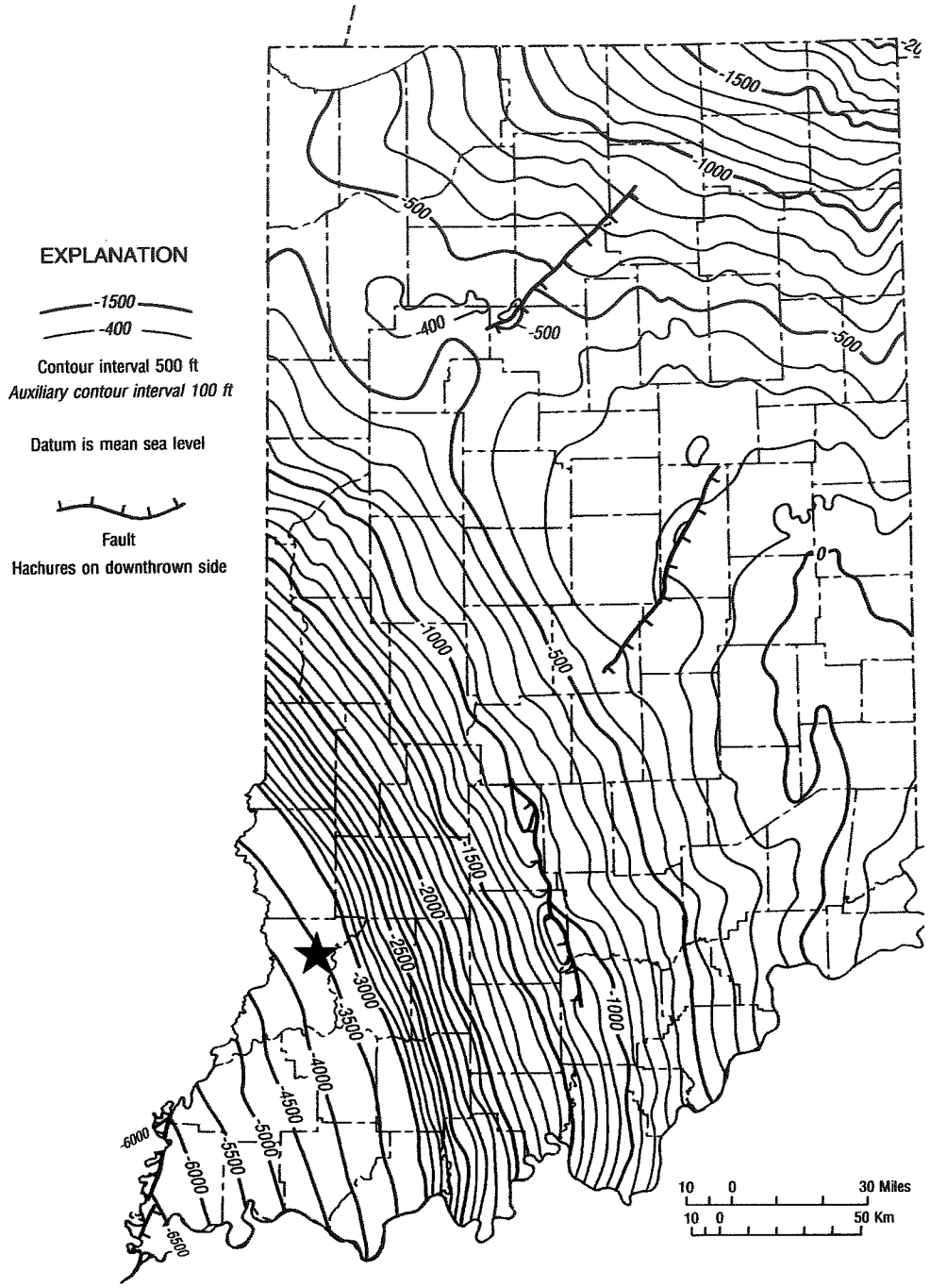
HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

FIGURE F.3-4

DUKE ENERGY
EDWARDSPORT FACILITY

MAP OF INDIANA SHOWING STRUCTURE ON TOP OF THE KNOX SUPERGROUP

DATE: 12/11/06	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:



LEGEND

★ SITE LOCATION

N

SOURCE: RUPP, 1991

SUBSURFACE

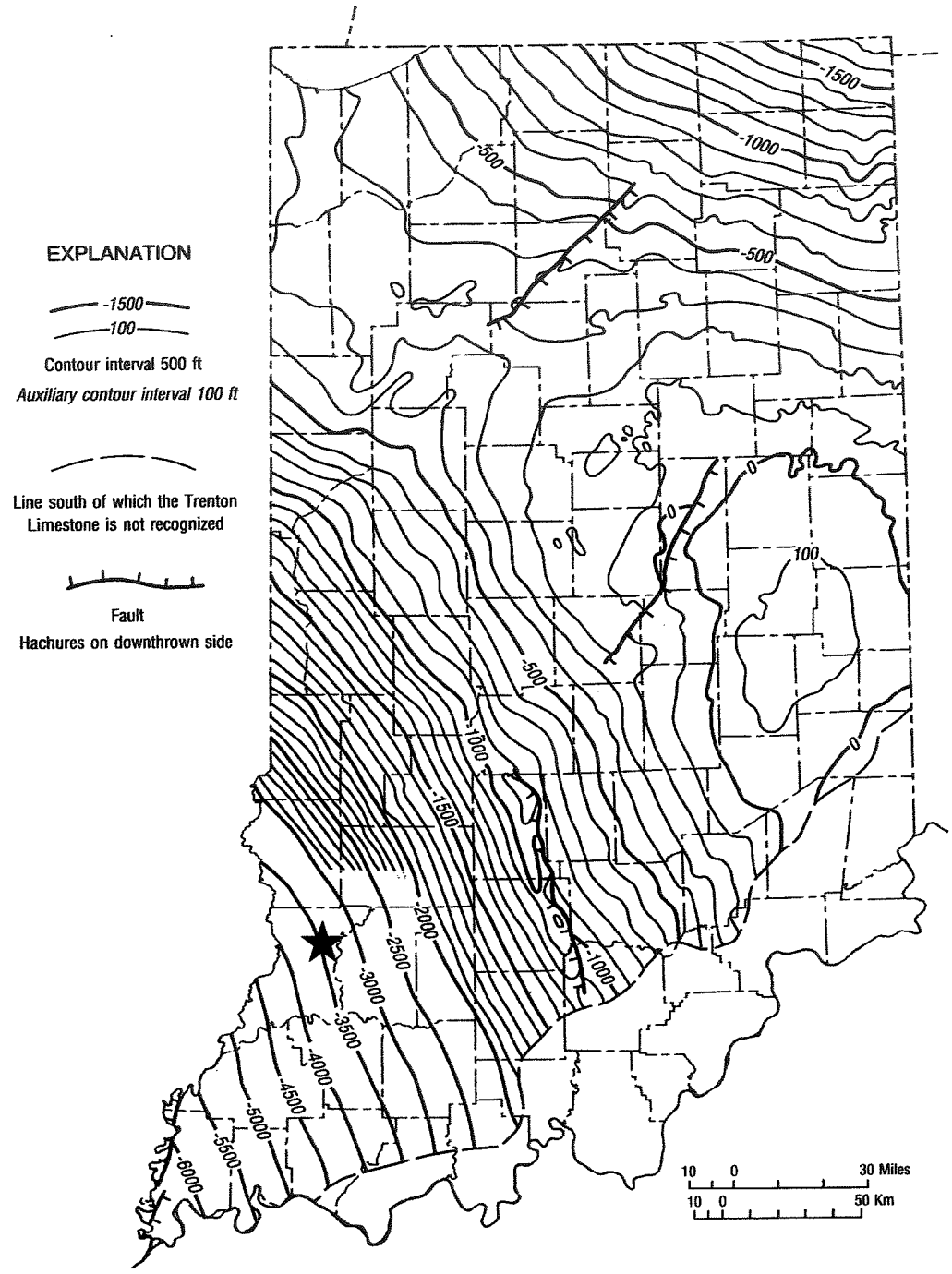
HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

FIGURE F.3-5

DUKE ENERGY
EDWARDSPORT FACILITY

MAP OF INDIANA SHOWING STRUCTURE ON TOP OF THE BLACK RIVER GROUP

DATE: 12/11/06	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:



LEGEND

★ SITE LOCATION

N

SOURCE: RUPP, 1991

SUBSURFACE

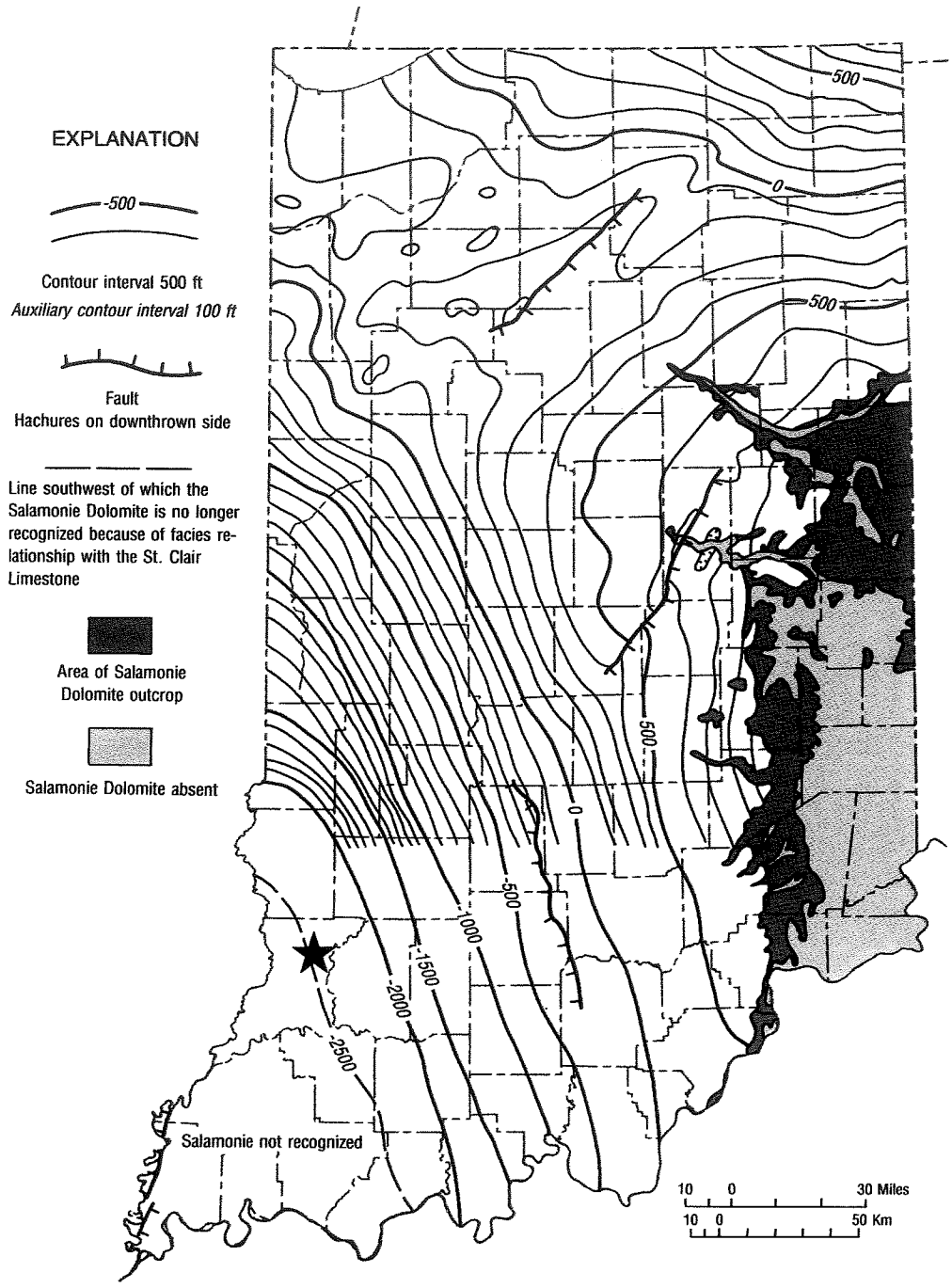
HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

FIGURE F.3-6

DUKE ENERGY
EDWARDSPORT FACILITY

MAP OF INDIANA SHOWING STRUCTURE ON TOP OF THE TRENTON LIMESTONE

DATE: 12/11/06	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:



LEGEND

★ SITE LOCATION

N

SUBSURFACE

HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

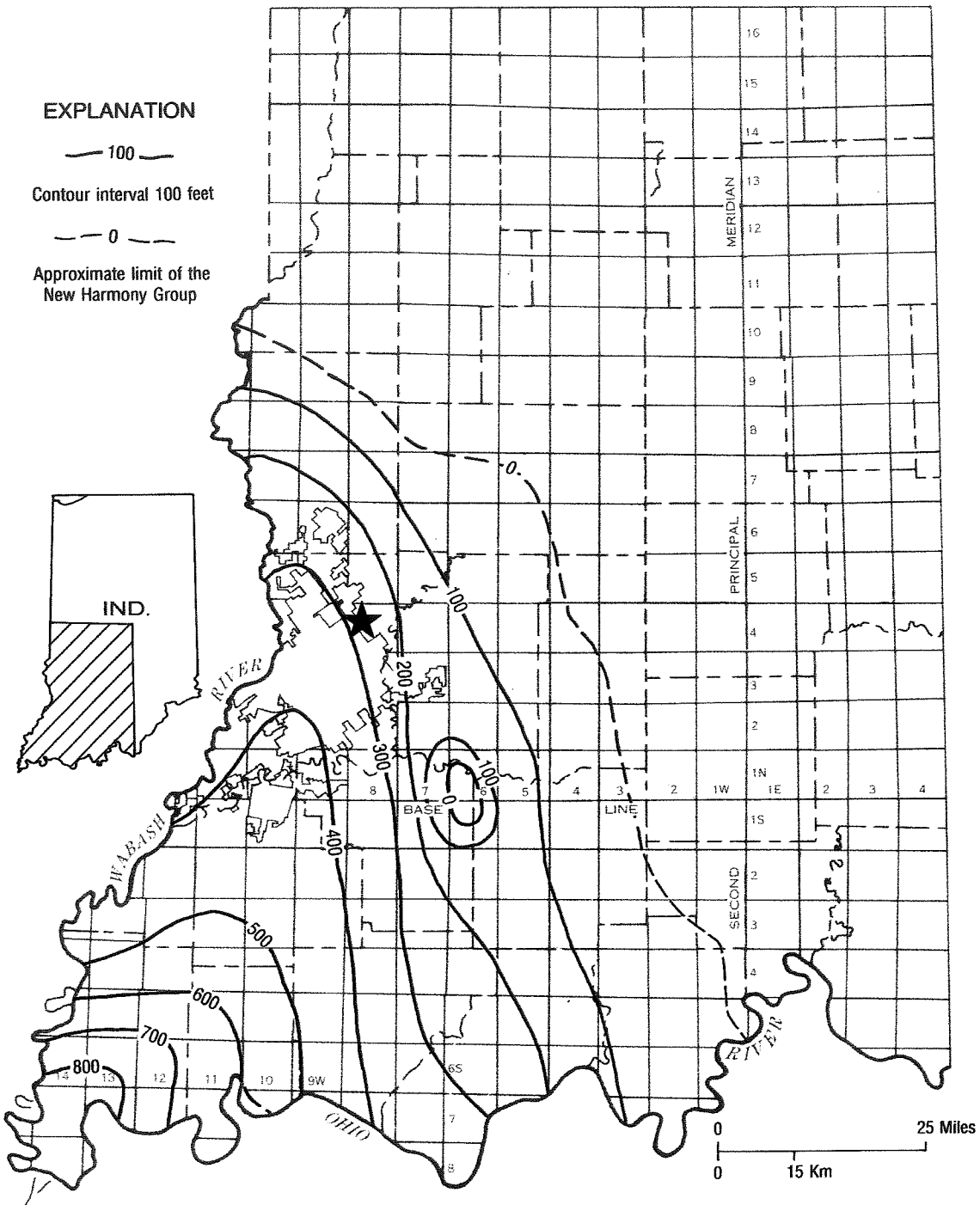
FIGURE F.3–7

DUKE ENERGY
EDWARDSPORT FACILITY

MAP OF INDIANA SHOWING STRUCTURE ON TOP OF THE SALAMONIE DOLOMITE

DATE: 12/11/06	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:

SOURCE: RUPP, 1991



LEGEND

★ SITE LOCATION

SOURCE: RUPP, 1991

SUBSURFACE

HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

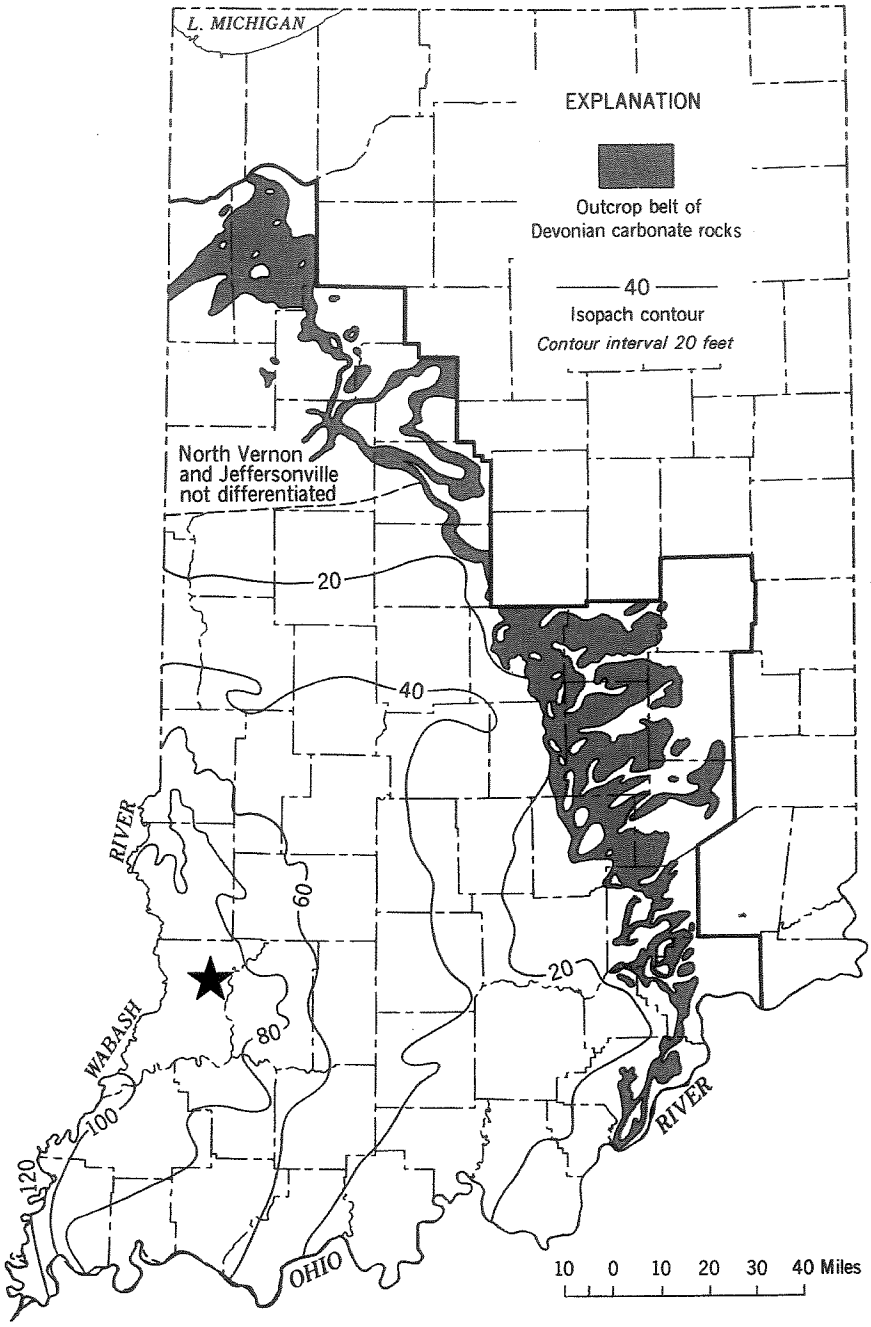
FIGURE F.3–8

DUKE ENERGY

EDWARDSPORT FACILITY

MAP OF INDIANA SHOWING
THICKNESS OF THE NEW HARMONY GROUP

DATE: 12/11/06	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:



LEGEND

★ SITE LOCATION

N

SOURCE: BECKER, 1974

SUBSURFACE

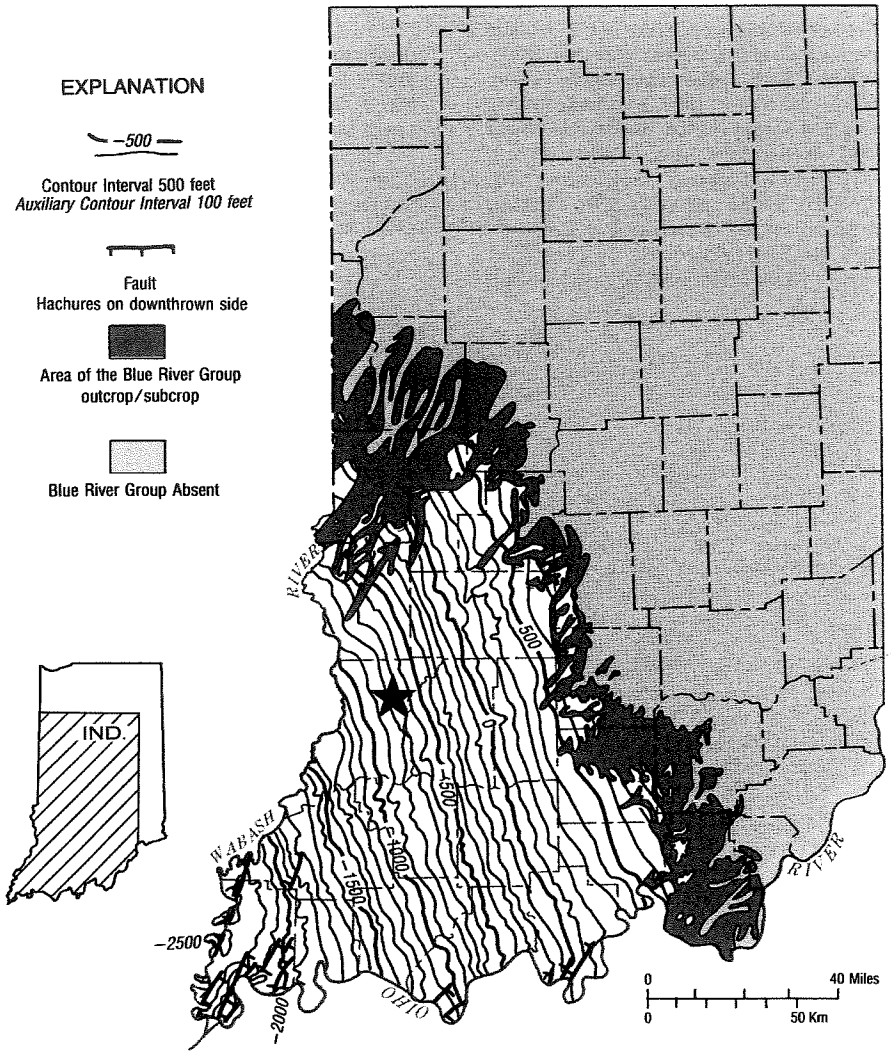
HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

FIGURE F.3-9

DUKE ENERGY
EDWARDSPORT FACILITY

MAP OF INDIANA SHOWING
THICKNESS OF THE NORTH VERNON LIMESTONE

DATE: 12/11/06	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:



LEGEND

★ SITE LOCATION

N

SUBSURFACE

HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

FIGURE F.3–10

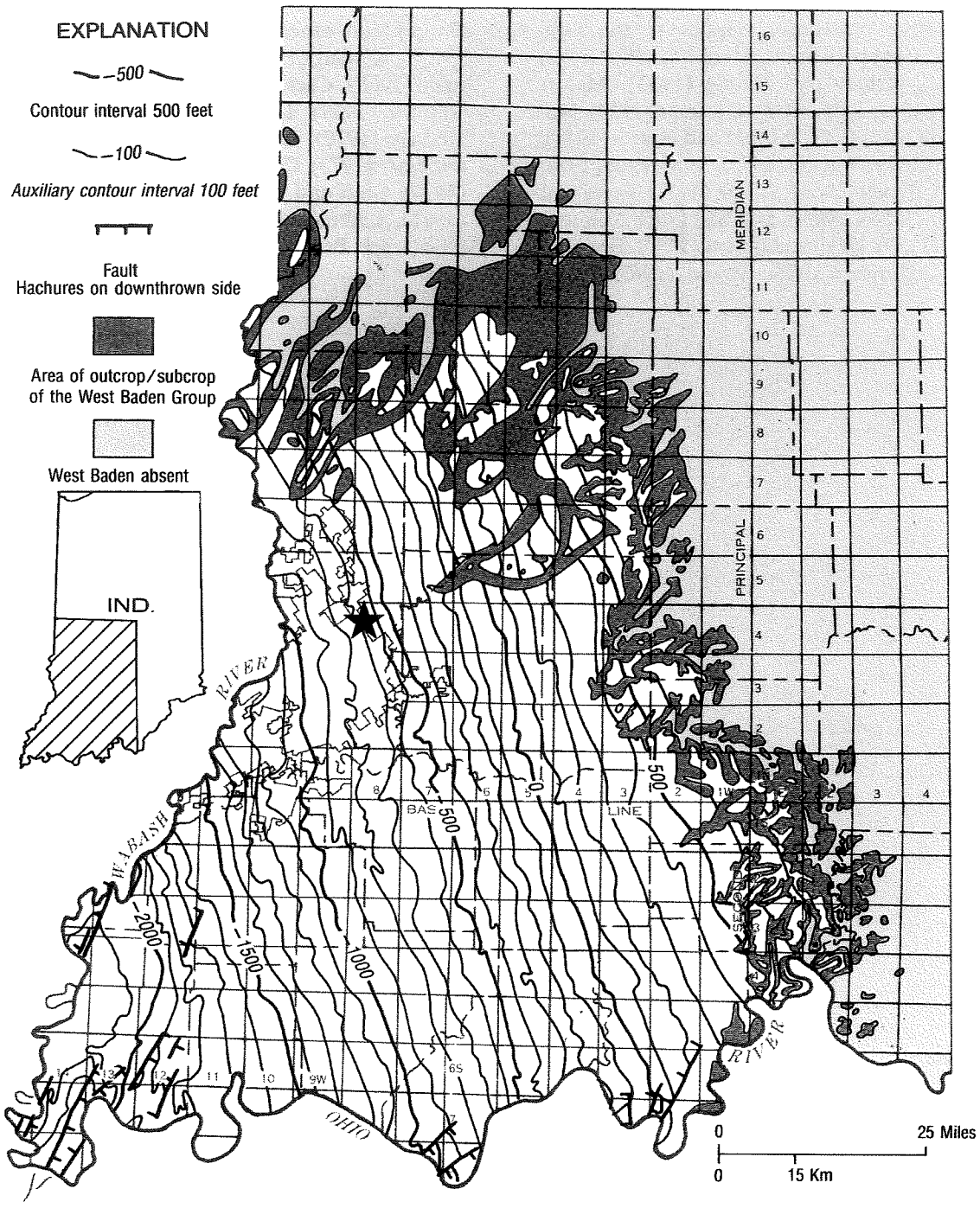
DUKE ENERGY

EDWARDSPORT FACILITY

MAP OF INDIANA SHOWING STRUCTURE ON TOP OF THE BLUE RIVER GROUP

DATE: 12/11/06	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:

SOURCE: RUPP, 1991



LEGEND

★ SITE LOCATION

N

SUBSURFACE

HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

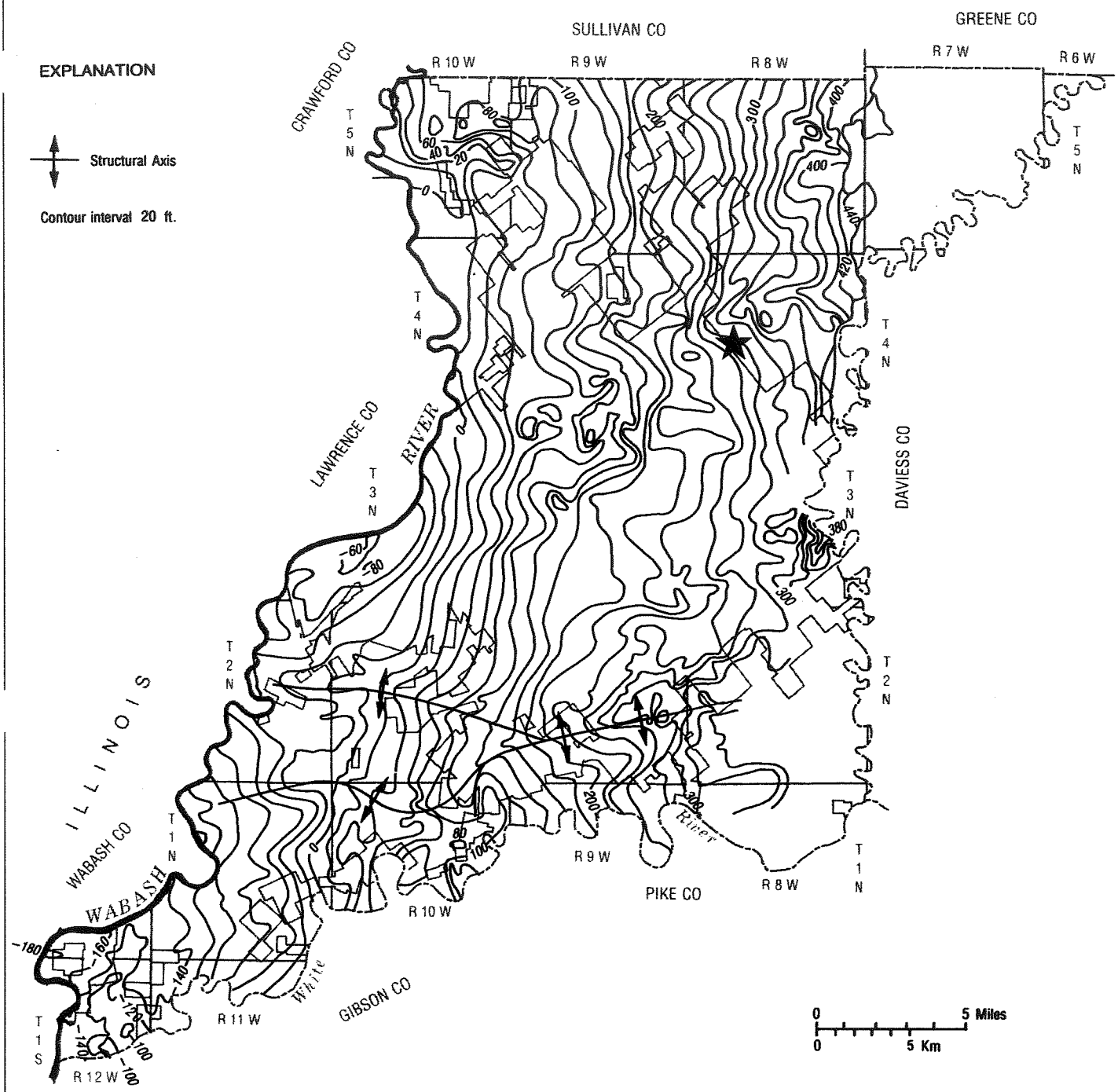
FIGURE F.3-11

DUKE ENERGY
EDWARDSPORT FACILITY

MAP OF INDIANA SHOWING STRUCTURE ON TOP OF THE WEST BADEN GROUP

DATE: 12/11/06	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:

SOURCE: RUPP, 1991



LEGEND

★ SITE LOCATION

SOURCE: HARPER AND EGGERT, 1995

SUBSURFACE

HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

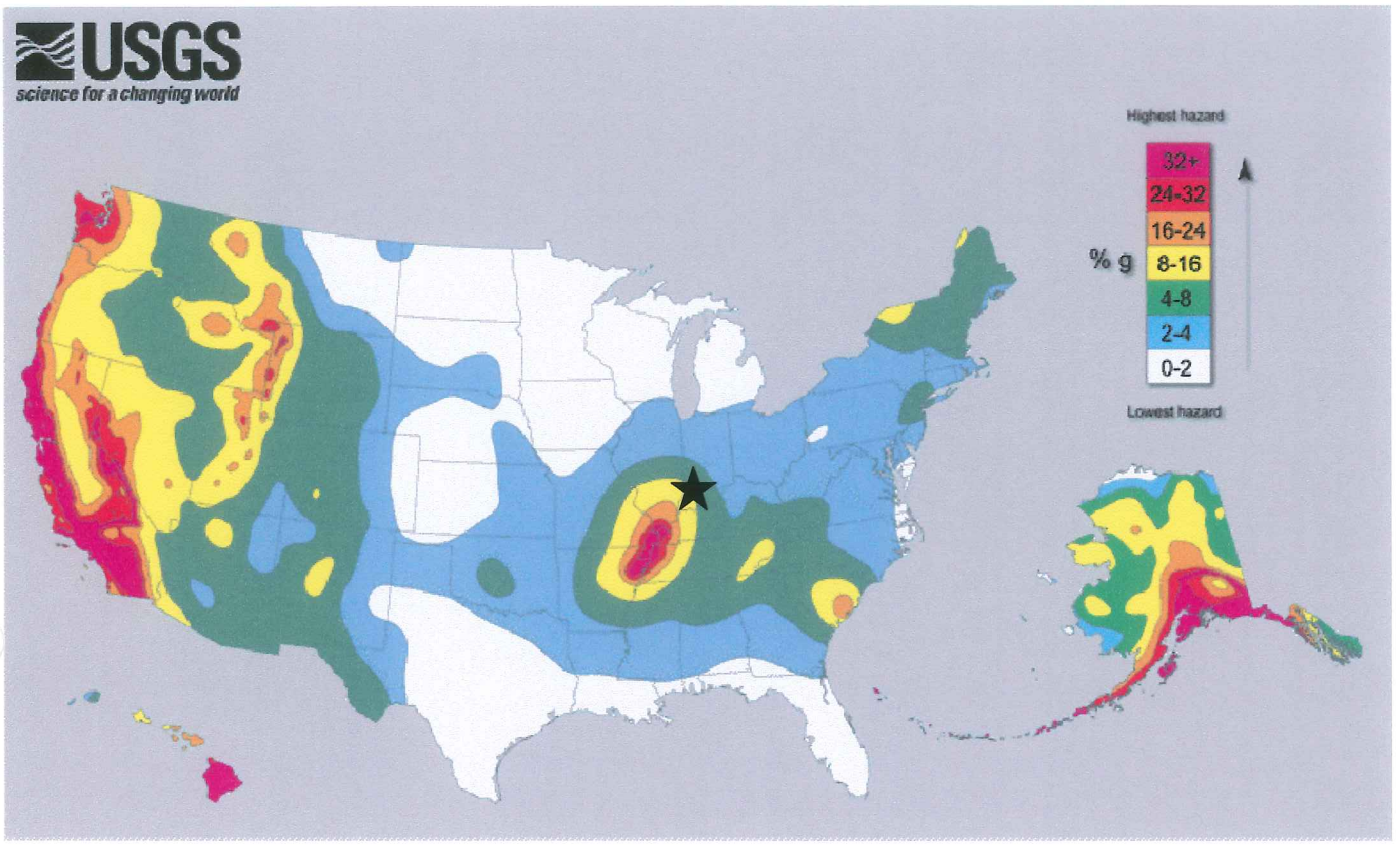
FIGURE F.3–12

DUKE ENERGY

EDWARDSPORT FACILITY

MAP OF KNOX COUNTY SHOWING THE ELEVATION RELATIVE TO MEAN SEA LEVEL OF THE TOP OF THE SPRINGFIELD COAL MEMBER

DATE: 12/11/06	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:



LEGEND

★ SITE LOCATION

N

SOURCE: NATIONAL EARTHQUAKE INFORMATION CENTER

SUBSURFACE

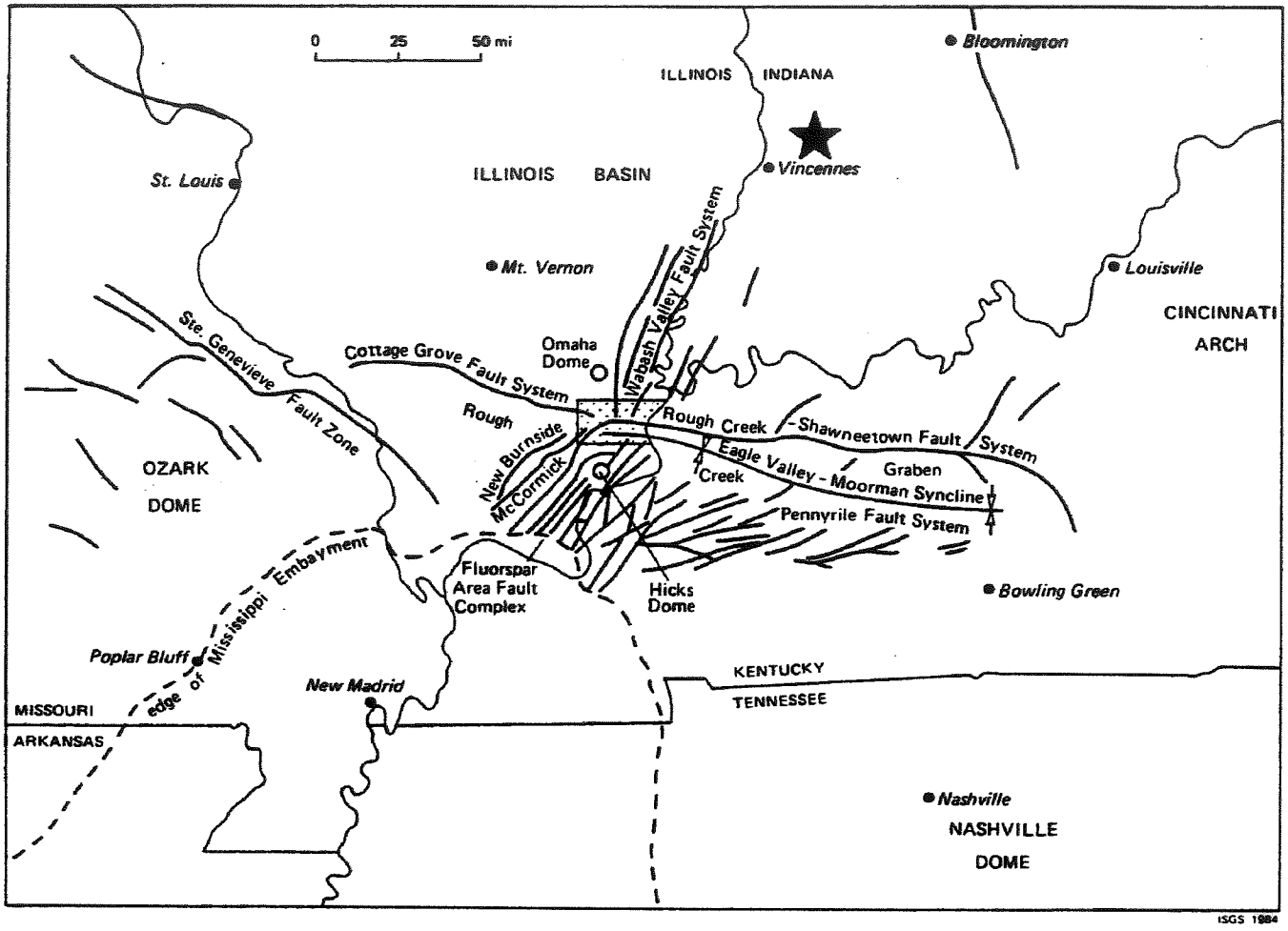
HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

FIGURE F.5–1

DUKE ENERGY
EDWARDSPORT FACILITY

SEISMIC RISK MAP

DATE: 12/11/06	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:



LEGEND

★ SITE LOCATION

N

SOURCE: NELSON AND LUMM, 1987

SUBSURFACE

HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

FIGURE F.5-2

DUKE ENERGY
EDWARDSPORT FACILITY

MAP OF REGIONAL TECTONIC SETTING ILLUSTRATING LOCATION OF WABASH VALLEY FAULT SYSTEM

DATE: 12/11/06	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:

DRAWINGS

SUBSURFACE

ATTACHMENT G

DOES NOT APPLY TO CLASS I WELLS

ATTACHMENT H

OPERATING DATA

APR 2008

H. OPERATING DATA

Estimated average and maximum injection rate and volume

The estimated maximum injection rate for the proposed wells will be 800 gal/min with an estimated average injection rate of 600 gal/min. The estimated total volume of injectate for the project is 10,414,008,000 gallons (600 gal/min x 1,440 min/day x 365.25 day/yr x 33 yr) which is based on an average injection rate of 600 gal/min and a project life of 33 years.

Estimated average and maximum injection pressures

The expected maximum surface pressure is as follows:

$$P_{(surface)} = P_0 + \Delta P_{(Rise)} + P_{(friction)} + \Delta P_{(skin)} - P_h$$

* P_0 = (fresh water gradient x formation fluid specific gravity x depth of formation top) (.433 x 1.07) = .463 (.463 x 8280) = 3834

* $\Delta P_{(Rise)}$ = (based on Matthews and Russell - attached) = 233

* $P_{(friction)}$ = (150 gpm injection rate / 4000' of 4 1/2" x 11.6" lined carbon steel pipe) = 0

* $\Delta P_{(skin)}$ = (skin factor will be determined after fall off data received) = 0

* P_h (hydrostatic pressure = fresh water gradient x depth of formation top) (.433 x 8280) = 3585

* $P_{(surface)}$ = (3834) + (233) + (0) + (0) - (3585) = 482 psi

H. OPERATING DATA

MAR — 2007

Estimated average and maximum injection rate and volume

The estimated maximum injection rate for the proposed wells will be 720 gal/min with a range of 500 to 720 gpm with an estimated average injection rate of 600 gal/min. The estimated total volume of injectate for the project is 9,467,280,000 gallons (600 gal/min x 1,440 min/day x 365.25 day/yr x 30 yr) which is based on an average injection rate of 600 gal/min and a project life of 30 years.

Estimated average and maximum injection pressures

The estimated average injection pressure, for each well, at an average injection rate of 150 gal/min is 234 psi, assuming a skin factor of 0. A pressure loss of 0 (zero) psi was calculated for an injection rate of 150 gpm, based on 4,000 feet of 4½ inch, 11.6 lb/ft carbon steel injection tubing.

The surface injection pressure calculations for the estimated average and maximum injection rates are based on the equation presented in Attachment A as shown below:

$$P_{(surface)} = P_0 + \Delta P_{(rise)} + P_{(friction)} + \Delta P_{(skin)} - P_h$$

$$P_{(surface)} = (0.433 \times 8280) + 234 + 0 - (0.433 \times 8280)$$

$$P_{(surface)} = 234 \text{ psi}$$

Skin factor is an unknown variable and is dependent on the waste treatment process. This process is being designed to minimize the skin factor. The actual skin factor will be determined from an analysis of the pressure transient fall-off data that will be run after the well has been drilled and completed, and the treatment facility performance has been verified.

Source(s) of waste (brief description of industrial process(es) which produce the waste)

The injectate being disposed in the proposed deep wells involves the gasification of coal. Gasification starts with the preparation of a coal slurry by wet grinding coal in a rod mill. Slurry then exits the rod mill and is stored in a slurry tank. From the slurry tank the slurry is pumped to a gasifier vessel where it reacts with pure oxygen in a reducing environment to produce syngas. Syngas is a mixture of carbon monoxide and hydrogen. Syngas then exits the gasifier and is sent to a scrubber to remove particulate and unreacted carbon. Vitrified slag also is removed from the gasifier as a solid waste. The syngas is then passed through an acid gas removal system to remove the sulfur. The acid gas is then passed through a sulfur removal unit to produce elemental sulfur as a marketable by-product. The syngas is then moisturized and burned in a combined cycle power plant to produce electricity. Grey water is integrated into several of these operations including the syngas scrubbing operation, the slag removal operation, and the coal grinding operation as well as many other processes in the plant. This system tends to cycle up chlorides and that chloride level is controlled by blowdown from a grey water storage tank. This blowdown stream will be injected into the deep wells.

The injectate pH will range from typically 4.0 to 6.0, with an average of 5.0. The specific gravity is expected to range from 1.00 to 1.02. The temperature of the injected fluid will be range from approximately 170 to 200° F and will depend mainly on processing requirements.

Representative Waste Analysis

An estimated range of wastewater analyses is included as Appendix H-1 and as an Appendix to the Waste Analysis Plan included in Attachment P, Monitoring Program.

Plans for corrosion monitoring, if the waste is corrosive

The wastewater injectate is a non-corrosive hard water. Ferrous metals, according to Perry's Chemical Engineers Handbook, Volume Six, are compatible with this waste fluid. Consequently, no corrosion monitoring program has been proposed.

The well component materials for the Edwardsport facility were selected using standard engineering specifications for specific functions with a balance sought between engineering serviceability and economics.

Source(s) of waste (brief description of industrial process(es) which produce the waste)

The injectate being disposed in the proposed deep wells involves the gasification of coal. Gasification starts with the preparation of a coal slurry by wet grinding coal in a rod mill. Slurry then exits the rod mill and is stored in a slurry tank. From the slurry tank the slurry is pumped to a gasifier vessel where it reacts with pure oxygen in a reducing environment to produce syngas. Syngas is a mixture of carbon monoxide and hydrogen. Syngas then exits the gasifier and is sent to a scrubber to remove particulate and unreacted carbon. Vitrified slag also is removed from the gasifier as a solid waste. The syngas is then passed through an acid gas removal system to remove the sulfur. The acid gas is then passed through a sulfur removal unit to produce elemental sulfur as a marketable by-product. The syngas is then moisturized and burned in a combined cycle power plant to produce electricity. Grey water is integrated into several of these operations including the syngas scrubbing operation, the slag removal operation, and the coal grinding operation as well as many other processes in the plant. This system tends to cycle up chlorides and that chloride level is controlled by blowdown from a grey water storage tank. This blowdown stream represents the waste stream that will be injected into the deep wells.

The injectate pH will range from typically 4.0 to 6.0, with an average of 5.0. The specific gravity is expected to range from 1.00 to 1.02. The temperature of the injected fluid will be range from approximately 170 to 200° F and will depend mainly on processing requirements.

Representative Waste Analysis

Duke supplied an estimated wastewater analyses range; a copy is included as Appendix H-1 and as an Appendix to the Waste Analysis Plan included in Attachment P, Monitoring Program.

Plans for corrosion monitoring, if the waste is corrosive

The wastewater injectate is a non-corrosive hard water. Ferrous metals, according to Perry's Chemical Engineers Handbook, Volume Six, are compatible with this waste fluid. Consequently, no corrosion monitoring program has been proposed.

The well component materials for the Edwardsport facility were selected using standard engineering specifications for specific functions with a balance sought between engineering serviceability and economics.

APPENDIX H-1

RANGE OF ANALYSES - TYPICAL WASTESTREAM

RANGE OF ANALYSES - TYPICAL WASTESTREAM

PARAMETER	UNITS	HIGH	LOW
pH		6	4
Conductivity	µmho/cm	20000	11000
Alkalinity	mg/L	2000	600
Temperature	F	200	170
Flow Rate	gpm	700	500
ANIONS			
Bromide	mg/L	30	<2
Chloride	mg/L	4000	3000
Fluoride	mg/L	100	20
Formate	mg/L	3500	1500
Nitrate	mg/L	5	<0.2
Phosphate	mg/L	1.5	<0.4
Sulfate	mg/L	50	10
Sulfide	mg/L	60	15
Sulfite	mg/L	20	10
Thiocyanate	mg/L	15	4
Cyanide, total	mg/L	10	3
OTHERS			
Ammonia as Nitrogen	mg/L	3000	1000
COD	mg/L	2000	750
Oil and Grease	mg/L	3	<2
Total Phenolics	mg/L	0.05	<0.01
TSS	mg/L	150	75
TRACE ELEMENTS			
Aluminum	mg/L	20	3
Antimony	mg/L	0.1	<0.03
SUBSURFACE Arsenic	mg/L	1.0	<0.02

PARAMETER	UNITS	HIGH	LOW
Barium	mg/L	5.0	0.07
Beryllium	mg/L	0.1	<0.01
Boron	mg/L	70	30
Cadmium	mg/L	0.5	<0.01
Calcium	mg/L	270	20
Chromium, total	mg/L	4.0	<0.01
Cobalt	mg/L	0.02	<0.01
Copper	mg/L	0.1	<0.01
Iron	mg/L	10	0.2
Lead	mg/L	1.0	<0.01
Magnesium	mg/L	20	4
Manganese	mg/L	4	0.05
Mercury	mg/L	0.1	<0.01
Molybdenum	mg/L	0.05	<0.01
Nickel	mg/L	7.0	<0.02
Potassium	mg/L	70	10
Selenium	mg/L	0.5	<0.02
Silicon	mg/L	100	10
Silver	mg/L	0.5	<0.02
Sodium	mg/L	300	40
Strontium	mg/L	4	1
Thallium	mg/L	0.05	<0.01
Tin	mg/L	0.3	<0.1
Titanium	mg/L	0.05	<0.01
Vanadium	mg/L	0.1	<0.02
Zinc	mg/L	1.0	<0.02

SUBSURFACE

ATTACHMENT I

FORMATION TESTING PROGRAM

I. FORMATION TESTING PROGRAM

Procedures to verify depth of lowermost USDW, if needed

The lowermost USDW within the Edwardsport AOR is estimated at a depth of approximately 470 feet (0 MSL) within the Pennsylvanian Age bedrock by Mitchell & Rupp (1994). For purpose of delineating a definable aquifer as the lowermost USDW, the bottom of the Pennsylvanian Age Linton Formation (Carbondale Group) at a depth of -75 feet MSL [mean sea level] (555 feet BGL [below ground level] is considered to be the base of the lowermost USDW.

The surface hole will be drilled to 500 feet (100 feet below the base of the USDW) and will allow the geophysical logs (Table L-2) to record the base of the USDW.

The resistivity of the formation water will be calculated using the resistivity and porosity values recorded on the logs.

There is no open-hole testing planned to sample the lowermost USDW during the installation of the first well.

Procedures to obtain extrapolated formation pressure in porous and permeable zones within approximately 500 feet of the top of the injection zone (non-hazardous wells) or injection interval (hazardous wells)

As discussed in Sections L and M, a series of drill stem tests will be conducted during the drilling. The intervals to be tested will be determined from data collected while drilling. The open-hole drill stem tests will provide preliminary reservoir information regarding permeability-thickness product and bottomhole pressure.

The open-hole testing, combined with the open-hole geophysical log interpretations, will determine the primary injection zone to be targeted during well completion. Casing will be set at the top of the selected injection zone and cemented as described in Sections L and M. Injection and pressure falloff testing will be conducted as detailed in steps 10 through 12 of the Completion Procedure discussed in Section L.

The original formation pressure obtained from the pressure falloff testing will be used to calculate the formation pressures in porous zones within 50 feet of the top of the injection zone. The specific gravity of the fluid will be measured from samples of the formation fluid recovered in steps 5 and 6 of the Completion Procedure discussed in Section L.

The following equation will be used to extrapolate pressure to a well depth within 500 feet from the top of the Injection Interval:

$$P_D = P_L - 0.433\gamma_f(L - D)$$

Where:

P_D = Extrapolated formation pressure at depth D feet BGL, psia

P_L = Formation pressure measured at depth L feet BGL, psia

γ_f = Specific gravity of formation fluid sample recovered from Injection Interval

L = Depth BGL of pressure measurement taken in Injection Interval

Sampling and analysis procedures for formation fluid of 1) the first aquifer overlying the confining zone (hazardous and non-hazardous waste wells), 2) the injection zone (non-hazardous waste wells) or injection interval (hazardous waste wells), and 3) the containment interval (hazardous waste wells only).

When the primary injection interval is determined, the first aquifer overlying the confining zone will be sampled utilizing a wireline conveyed repeat formation tester while conducting the open-hole geophysical logging. A standard water analysis will be conducted to determine physical and chemical properties.

Cores and laboratory core testing for confining and injection zones (For non-hazardous waste wells, a minimum of one 30-foot core of the confining zone and one 30-foot core of the injection zone are required. For hazardous wells where injection of restricted waste is proposed, one or more cores of the containment interval will also be necessary.)

As previously discussed, the primary injection zone will be determined during drilling of the first well. Consequently, the confining and injection zones will be cored during the geophysical logging. Full-hole cores will be obtained in specific intervals during the drilling of wells as needed.

Physical core analysis will include lithologic descriptions. Rock density, porosity, and air permeability will be determined on selected core samples. In addition, permeability to both waste and brine will be determined on selected plug samples taken from obtained core. Both horizontal and vertical permeability will be measured. Brine and waste permeability measurements will be run utilizing methods with a high range of accuracy (10^3 to 10^{-6} md).

Testing for mechanical rock properties will include determinations of Young's Modulus, Poisson's Ratio, Tensile Strength, and Bulk Compressibility. Selected samples from each core will be tested. Injectate compatibility testing will be conducted with fluids and matrix material derived from the injection zone.

Compatibility testing of the injectate with the formation fluid will include analysis of fluid samples from the injection interval and injectate fluid sample combined in increasingly larger ratios with injectate to determine reactivity. These samples will be filtered and weighed to determine solids generation as a function of time. In addition, compatibility of the injectate with core samples from the injection zone will be tested. A core flow study will be preformed following various combinations of formation fluid mixed with injectate through the core for a designated period of time.

Determination of fracture closure pressure of injection zone (non-hazardous wells) or injection interval (hazardous wells)

Fracture closure pressure will be determined during the step-rate test of the injection zone discussed in the Construction Procedure in Section L. This data will be collected in support of the geophysical calculations of the mechanical properties of the formation.

Injectivity/fall-off testing of injection zone/interval, including interference testing if multiple wells are proposed

An injection/falloff test is included in Section L. The testing will be performed in accordance with USEPA Region 5 Guidelines for Reservoir Testing (Regional Guidance #6). The rate and volume of fluid to be injected will be determined from preliminary injection testing results and will be based on the injectivity determined from those previous tests.

ATTACHMENT J

STIMULATION PROCEDURE

J. STIMULATION PROCEDURE

It is not anticipated that the injection interval will need to be stimulated after drilling and completing the proposed Edwardsport wells. However, if it is determined after drilling and testing the wells that the receptivity of the injection interval needs to be chemically enhanced to reduce formation skin damage, the injection interval may be treated with a mud acid (12% Hydrochloric and 3% Hydrofluoric Acid) program. This operation will consist of placing the mud acid across the entire injection interval and pumping the acid into the zone after the acid has been allowed to soak for an appropriate period. The exact volume, make-up and placement technique of the acid will be developed after the necessary performance data from the proposed injection wells have been collected and analyzed. The United States Environmental Protection Agency (USEPA) will be notified prior to any acid stimulation of the injection formation. It should be noted that during acid stimulations, the annulus pressure may not be maintained at a 100 psi differential over the injection pressure.

ATTACHMENT K

INJECTION PROCEDURES

K. INJECTION PROCEDURES

Plant plan showing flow line of waste stream(s) to be injected

As of the time of permit application, the Edwardsport facility that will generate wastewater to be injected has not been constructed. A proposed plant outline is included as Figure K-1.

Description of filters, storage tanks (including capacity), and any pretreatment processes and facilities, including location on plant plan.

As of the time of permit application, the Edwardsport facility that will generate wastewater to be injected has not been constructed. Based on past site practices where deep well injection has been utilized, it is anticipated that wastewater received from the waste treatment facility will be injected into the wells with multiple, variable speed positive displacement injection pumps connected in parallel. A sample tap will be located on the injectate flow line before the injection pumps.

Figure K-2 provides a simplified schematic diagram showing the flow of the injectate from the coal gasification process, through the waste treatment facility , to the injection well.

Description of injection pumps, including rate capacity

As of the time of permit application, the Edwardsport facility that will generate wastewater to be injected has not been constructed. Based on past experience, it is anticipated that the facility will utilize positive displacement injection pumps with a specific rated capacity and maximum operating pressure (as yet to be determined).

Description of annulus pressure maintenance system

As of the time of permit application, the Edwardsport facility that will generate wastewater to be injected has not been constructed. Based on past experience, it is anticipated that the annulus pressure maintenance system at each wellhead will consist of a 200 gallon, nitrogen pressurized pot that is filled with diesel oil and connected to the annulus of 4½ inch injection tubing and 9⅝ inch protection casing. An annulus pot will have a sight glass to allow the diesel level to be monitored visually as well as an electronic transmission that will be monitored continuously at the main computer terminal.

The annulus pressure will be maintained at least 100 psi above the wellhead injection pressure. An analog pressure gauge will be connected to the well annulus and a pressure transducer will also be connected to the well annulus that transmits a signal to a digital converter. The digital output of the annulus pressure will be transmitted to a computer for continuous monitoring of the annulus pressure.

A female coupling will be connected below the analog annulus pressure gauge to allow for independent determination of annulus pressure. A schematic diagram of the anticipated well annulus maintenance system has been included as Figure K-3.

Description of alarm and shut-off system

Continuous measurements of injection pressure and annulus pressure will be monitored by a shut-down system that will shut-down the injection pumps if the wellhead injection pressure exceeds a predetermined maximum allowable injection pressure or if the annulus pressure drops below a predetermined minimum allowable annulus pressure. Since the regulations state that the annulus pressure is to be kept at a minimum of 100 psi over the injection pressure, the annulus pressure will have a maximum of 150 psi above the MASIP. The annulus pressure pump will start when pressure drops to 50 psi above the MASIP. The alarm and shutdown will occur when the annulus pressure drops below 25 psi over the MASIP. The injection and annulus pressures will be monitored continuously with analog or digital gauges on the wells and with transducers tied in with the well main computer terminal.

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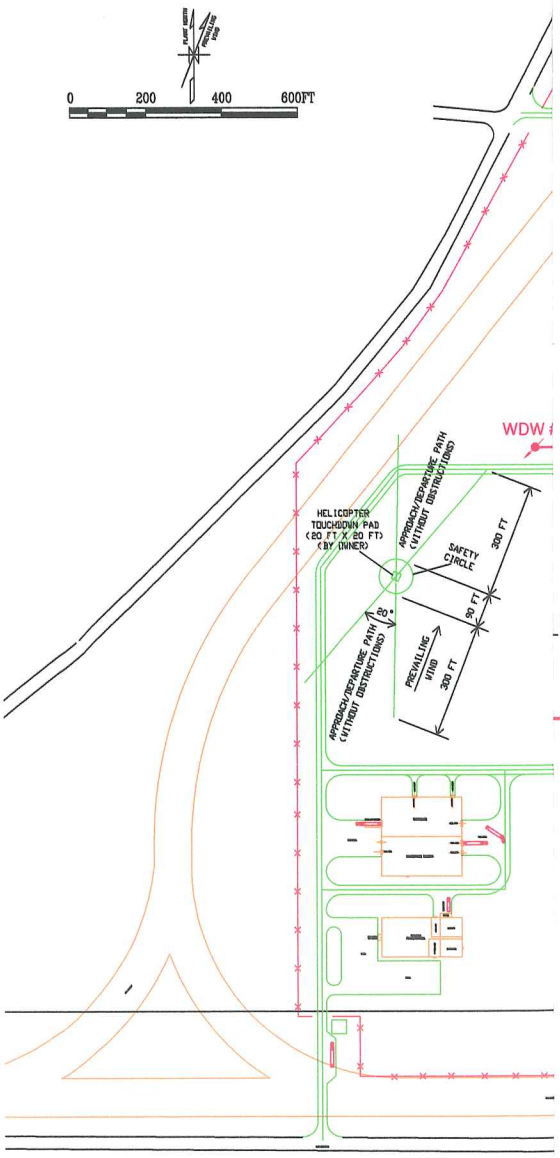
FIGURES



LEGEND

PROPOSED INJECTION WELL LOCATION

PROPOSED WASTESTREAM FLOW LINE

SUBSURFACE

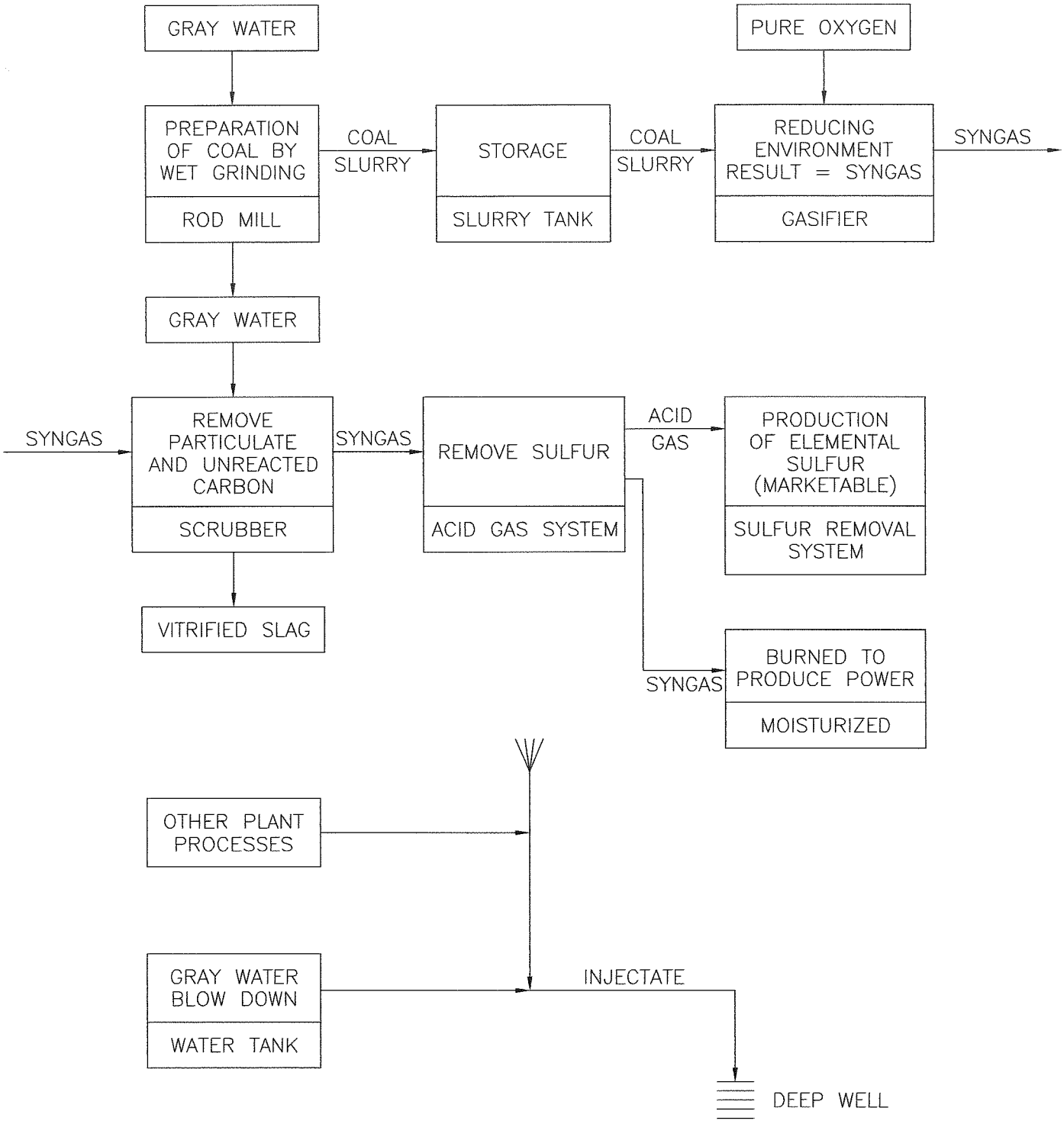
HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

FIGURE K-1

DUKE ENERGY
EDWARDSPORT FACILITY

PROPOSED PLANT SITE DIAGRAM

DATE: 12/14/06	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:



SUBSURFACE

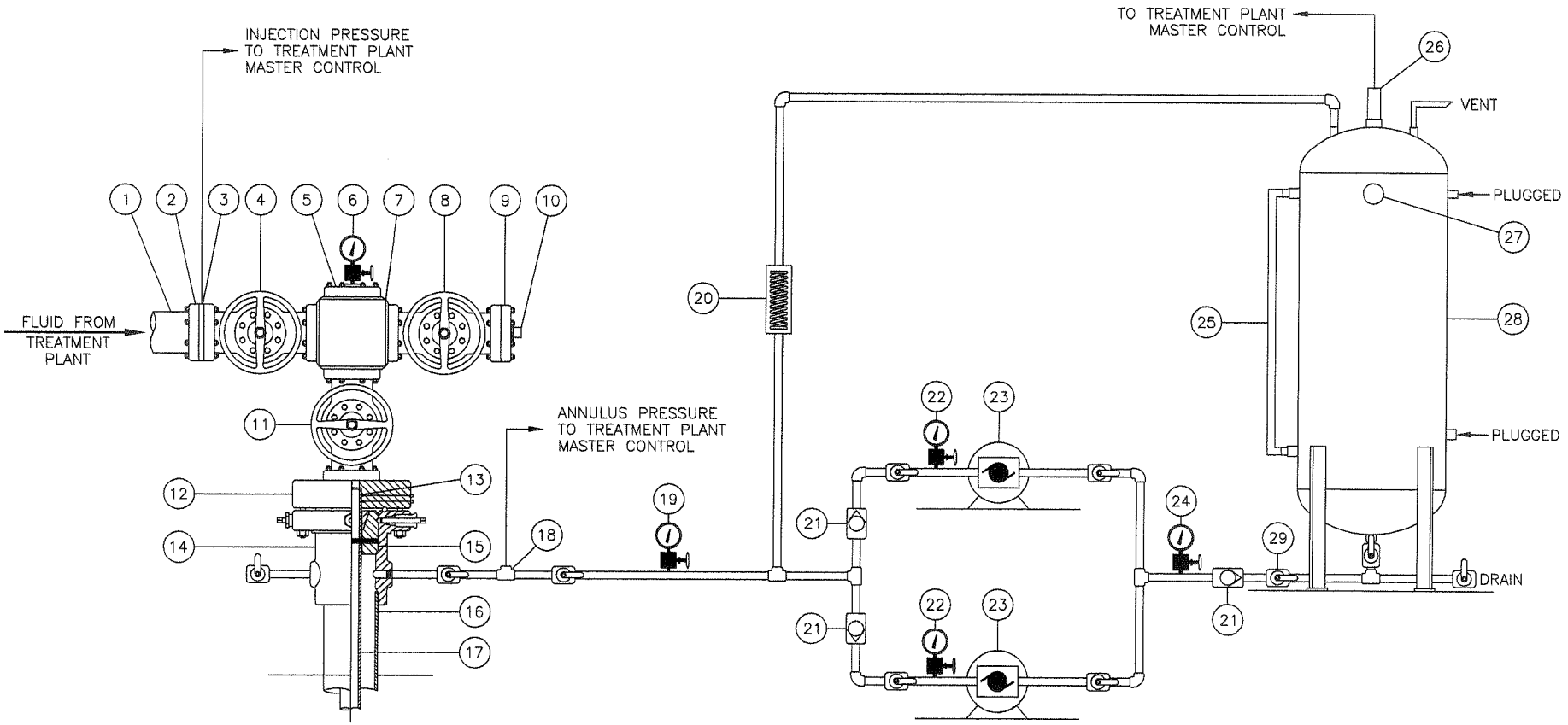
HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

FIGURE K-2

DUKE ENERGY
EDWARDSPORT FACILITY

BLOCK FLOW DIAGRAM

DATE: 12/18/06	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO:



NOTE: All tubing, valves, fittings, and accessories to be schedule 80 seamless A–106 rated at 2,000 psi working pressure

Underlined data for start–up purposes only

WELLHEAD AND ANNULUS PRESSURE MAINTENACE SYSTEM DETAILS

1. Injection flow line, 4" O.D.., yellow box fiberglass from injection pumps
2. DSA, 4 1/16", 3,000 psi x 4" 900 RF
3. Injection pressure sensor (to treatment plant master control)
4. Injection wing valve, 4", full opening, 3,000 psi
5. Flange, 4 1/16", 3,000 psi x 2 7/8" 8RD
6. Wellhead injection pressure gauge with block valve (0–3,000 psi)
7. Junction block
8. Secondary wing valve, 4", full opening, 3,000 psi
9. Flange, 4 1/16", 3,000 psi x 2" LPO
10. Plug, 2", 3,000 psi
11. Master valve, 4", full opening, 3,000 psi
12. Tubing bonnet, DSPOF, 11" x 4 1/16", 3,000 psi with two 7" I.D. P–seals, with TST ports
13. 4½" I.D. P–seals
14. Casing head, 9 5/8" SOW x 11", 3,000 psi WP, C–22–L (2P) with 2" LPO
15. Casing hanger, automatic C–22, 11" x 4½"
16. Surface casing, 9 5/8", 36 & 40 lb/ft
17. 4½" injection tubing, plastic lined
18. Annulus pressure sensor to treatment plant master control, alarm and pump shut down at 900 psi
19. Annulus pressure gauge (0–2,000 psi) with block valve for test port
20. Adjustable relief valve set at 1,800 psi, back to tank
21. Check valve as required
22. Pump pressure gauge with block valve as required (0–2,000 psi)
23. Pressure pump, Cat model 317, max. working pressure 2,000 psi, start on min. pressure 950 psi, stop on max. pressure 1,050 psi
24. Suction pressure gauge with block valve (0–2,000 psi)
25. Sight glass
26. Fluid level sensor to treatment plant master control (min. alarm 50 gallons)
27. Fill port
28. 200 gallon atmospheric steel tank filled with 9# brine and "Nalco" conditioner
29. Ball valve as required (typical)

NOT TO SCALE

SUBSURFACE

HOUSTON, TX.
SOUTH BEND, IN.
BATON ROUGE, LA.

FIGURE K–3

DUKE ENERGY

EDWARDSPORT FACILITY

WELLHEAD AND ANNULUS PRESSURE MAINTENANCE SYSTEM DETAILS

DATE: 12/18/06	CHECKED BY: RWS	JOB NO: 60F5923
DRAWN BY: CRB	APPROVED BY: RTB	DWG. NO: